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A PREFACE TO SOCIAL PSYCHOLOGY

By Madison Bentley

I. Typical problems of social psychology.
II. The chief factors in social interaction.
III. The primary social formations.
A. Comparison of the congregate and the assemblage.
IV. The conditions of mental process and of mental function.
V. Social consciousness and social objects.
VI. The properties of the congregate.
A. Grades of integration among congregates.
B. The process of polarization.
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The tasks of social psychology are many and diverse; but they all rest finally upon social interaction,—upon the fact that individuals tend to believe and to think, to feel and to resolve, to speak and to act, to labor and to create, in mutual dependence. This social dependence is exemplified in innumerable ways by the daily intercourse of men. Communication through speech and gesture, every kind of human congregation, imitative performances, the works of art, the organization of the state, and all acts or attitudes of persuasion, acquiescence, and command reveal the social origin or the social tempering of mental function.

It is plain that this fundamental dependence of mind upon mind bears many aspects; and it is to the diversity of these aspects that we may confidently look for the explanation of the variety and multiplicity of tasks and problems which social psychology has undertaken.

I. Typical Problems of Social Psychology

Many of these tasks and problems essayed by the social psychologist arise as soon as we reflect upon the primary facts of interaction. In the first place, the *products* of social interaction are to be found in every human community. It is inconceivable that a man living from early childhood in solitary independence

should create laws, customs, myths, government and language. These institutions are the creations of groups and clusters. They are the precipitates of organization, of communication, and of communal activities. And one of the obvious tasks of the student of such mental dependence as we have presupposed consists just in the examination of these social products for the light which they may shed upon the mental processes concerned in their formation. It is this task which is attempted by Grosse,[1] by Lazarus and Steinthal,[2] and—more thoroughly and consistently—by Wundt,[3] in his "psychology of peoples." This kind of social psychology seeks to derive mental laws which shall illustrate the reciprocal effects wrought through and upon the human mind by gregarious life.

Again, it is possible to look upon the individual, viewed in all his relations to human and natural surroundings, as the *unit in social interaction.* When so regarded the individual usually becomes the "self," and society the congregation or the hierarchy of selves. A descriptive account of society then takes either the genetic form, as in Baldwin's derivation of the social self,[4] or the analytical form, as exemplified by the late Professor James.[5]

Still another method of considering the facts and the issues of mutual dependence of mind upon mind has given us the beginnings of a *comparative psychology of human societies;*—a psychology which compares racial epochs and cultural levels, seeking to demonstrate the dependence of social organization upon the development of mind and upon the natural and nurtural conditions of social growth and change.[6] Uusually this "racial" or

[1] Grosse, E., *Die Anfänge der Kunst,* 1894.

[2] Lazarus, M., and Steinthal, H., *Zsch. f. Völkerpsychol. u. Sprachwiss.,* 1860, i, 1.

[3] Wundt, W., *Völkerpsychologie,* 2 vols., 1900-1909; *Elemente der Völkerpsychologie,* etc., 1912.

[4] Baldwin J. M., *Social and ethical interpretations,* etc., 4th ed., 1906; *Genetic theory of reality,* etc., 1915, 32 ff.

[5] James, W., *The Principles of Psychology,* 1890, i, 292 ff.

[6] Le Bon, G., *The psychology of peoples,* 1898: Lévy-Bruhl, L. *Les fonctions mentales dans les sociétés inférieures,* 1910: Frazer, J. G., *The golden bough,* etc., 1911-15: Boas, F., *The mind of primitive man,* 1913: Rivers, W. H. R., *The Todas,* 1906: Tylor E. B., *Primitive culture,* 1871.

"anthropological" or "ethnic" branch of psychology,—because it goes into such matters as anthropology, history, sociology, and economics,—contains a good deal that is not really psychological; that is not immediately concerned, I mean, with the facts and laws of mind.

A different account of large social groups, made in the name of psychology, is to be found in such depictions as M. Boutmy has skillfully drawn of the English and American peoples. Although here political aspects receive much attention in the authors' *racial delineations,* the studies are generally accredited to social psychology.[7]

We should do an obvious injustice to the present state of the field of social psychology, if we failed to mention, even in this cursory survey of problems and points of view, either the notable attempts of such writers as MacDougall and Wallas to discover the ground of social phenomena in the *innate constitution of the individual,*[8] or the less subtle reference of social phenomena to the *abstract laws* of imitation, suggestibility, sympathy, consciousness of kind, and invention.[9]

[7] Boutmy, E., *The English people, a study of their political psychology,* 1904; *Éléments d'une psychologie politique du peuple Américain,* etc., 1902: Bryce, J. B., *The American commonwealth,* rev. ed., 1910: Münsterberg, H., *The Americans,* 1904.

[8] MacDougall, W., *An introduction to social psychology,* 2nd ed., 1909: Wallas, G., *The great society, a psychological analysis,* 1914, chaps. ii, iii, iv. Upon this basis various recent systems of sociology have built: *e.g.,* Hayes, E. C., *Introduction to the study of sociology,* 1915, 209 ff, and Ellwood, C. A., *Sociology in its psychological aspects,* 1912, chap. ix.

[9] Tarde, G., *Les lois de l'imitation, étude sociologique,* 1890 (3rd ed., 1900); *Études de psychologie sociale,* 1898: Ross, E. A., *Social psychology,* etc., 1908: Le Bon, G., *The crowd, a study of the popular mind,* 1903: Giddings, F. H., *The principles of sociology,* etc., 3rd ed. 1896. Tarde's object was "de dégager des faits humains leur côte sôciologique pur" (*Les lois,* etc., 2nd ed., 1895, pref. x). Accordingly, "imitation" was for him a sociological matter: "partout ou il y a un rapport social quelconque entre deux êtres vivants, il y a imitation" (*ibid.,* pref. viii). Nevertheless, when he comes to a stricter definition of the term, it appears to be psychological: "l'impression mentale à distance par la quelle un cerveau reflète en un autre cerveau ses idées, ses volontés, même ses manières de sentir" (*Études de psychologie sociale,* 45). Tarde maintains his consistency only by including all sociology in psychology: it is just collective or "inter-cérébrale" psychology (*ibid.,* 47, 49). This gen-

This empirical and incomplete list of kinds and varieties in the kingdom of social psychology is already long enough to suggest a definite reason for the vague implications of the term brought under our consideration. It is obvious that the words "social psychology" must either be used less variously than at present or else be so defined as to admit in proper perspective all the unlike varieties which now independently claim the same designation.

II. The Chief Factors in Social Interaction

After the omission of those "social" studies which are not primarily psychological, we must, as it seems to the writer, acknowledge that all the remaining problems can show a certain right to the title of "social psychology"; although the treatment of them has included a great deal that is not in strictness psychological. They mainly derive their unlikeness—as I have urged—from the fact that they consider what has been called the fundamental fact of social interaction from different points of view. Now these points of view may reasonably be reduced to three; one regards the individual, another the collective group, and the third the social products and precipitates of interaction. We study "social mind," as the vague term has it, by regarding either the members of the group or the group itself or, finally, those social creations and monuments which survive the process of interaction. The creations and monuments include both uniformities in belief, thought, standpoint, emotion and action (Ross's "psychic planes and currents") and such enduring and detached productions as language, religion, works of art, railways and cities.

We may repeat, therefore, that there underlies all the varieties of psychological enquiry into social phenomena,—whether descriptive, historical, comparative, or explanatory,—the primary fact of mutual dependence of mind upon mind. But if this ulti-

erous extension of the field of psychology is doubtless responsible for a great deal of loose description and interpretation among current American writers on "social psychology." . . . A useful bibliography for this subject may be found in Ellwood, *op. cit.*, 402-4.

mate reduction of the problems of social psychology is acceptable, then it seems to follow that the main entrance to all the connecting avenues of this special province of the mental sciences will be afforded by a study of those modifications of mental process and function which are referable to the presence or to the assumption of other like individuals. If individuals tend "to believe and to think, to feel and to resolve, to speak and to act, to labor and to create, in mutual dependence", then their membership-in-the-group is the primary fact on which social psychology rests.[10]

Now membership-in-a-group may be looked at, as I have intimated, from the standpoint of the group, from that of the individual-member, and from that of the group-product. The first two stand logically prior to the third; although such writers as Wundt have contended that it is possible directly to infer from the social products and institutions to those laws of mental development which are exemplified in the history of society, *e.g.*, from language, myth, and custom, to the development of thought, imagination and will. The first two points of view are plainly correlative. The description of the group or collection is obviously involved in the description of the members; and conversely, social "dependence" implies the integration of members-

[10] This conclusion diverges from the standpoint of Ross, which considers groups as objects of *sociological* study and which reserves social psychology for the study of "planes and currents of uniformity." With regard to the difference in point of view it may be remarked (1) that our "groups" are not Ross's structures, institutions, "organizations" of society, but temporary and flowing *mental* collections, (2) that the planes and currents which Ross regards as "psychic" we regard as objects and products of mind and not themselves mental processes, and (3) that Ross's social psychology is explanatory (it explains "how so many planes in feeling, belief or purpose have established themselves"), while our is primarily descriptive.—For the views of sociologists upon the proper functions of social psychology and of sociology, see Ellwood, *op. cit.*, 1912, 1 ff, 60 ff. Practice seems to represent almost all degrees of dependence upon psychology, ranging between the extreme positions of Tarde and Durkheim. Tarde identifies social psychology and sociology (see above, page 3) Durkheim regards the facts of sociology as distinct from, and independent of, psychology. The present essay takes the position that social psychology, on its side, is to be established independently of sociological applications. (For Durkheim, E., see *Les règles de la méthode sociologique*, 1907, 4th ed., 5 ff, 120 ff, 172 ff.)

in-a-group. In our attempt to distinguish the primary forms of grouping, we may expect therefore to find that the modification of the members must also be implicitly recognized. For if we should try to avoid the description of members we should fall into the error of hypostatising that mythical and abstract being widely known as the "social mind" or the "collective mind"; and if we should omit the group we should atomize out of existence many of the most significant social facts.

III. The Primary "Social" Formations

This apparent dilemma brings us to the real *crux* of our task. We have to ask: What are the primary psychological forms of human integration? What characterizes and distinguishes these? What are the essential modifications of the members entering into each sort of collection? The formulation of these questions is enough to indicate that complete answers can be derived only by compendious researches, not by such a brief survey of the field as the present. This outline attempts no more than a statement of the principles and means to be used in more detailed investigations.

It is obvious that, if human collections are to be described in terms acceptable to psychology, the student must go beyond such general distinctions as the "crowd" and the "public" and such ill-defined qualifications as "suggestibility," "imitation," the "paralysis of reason" and the "loss of conscious personality." In place of such distinctions and qualifications he must seek for empirical characteristics of the group, for distinctive means of formation, for qualitative and quantitative properties, for differential functions, and for diversity of products. If such group-characteristics are not to be found, then it is doubtful whether the psychology of groups can be erected upon a scientific basis.

The principles of descriptive science make it evident, however, that the organization of such units or individuals as are qualitatively diverse invariably produces a totality possessing unique marks and properties. It is only the addition of naked quantities or values which produces a mere sum. The group-properties of

conjoined chemical elements and the morphological and physiological integrity of the living organism alike illustrate the production or "creation" of qualities and properties which characterize the total integration rather than the integrated members when these are regarded in isolation.[11]

The first distinction to be drawn among human groups separates the *congregate* from the *assemblage*.[12] The congregate includes all such groups as the audience, the reception, the jury, the throng, and the mob, where individuals are brought into physical proximity. The assemblage denotes individuals placed under common social conditions or "influences" though not physically conjoined.[13] Such *sympathic* groups are illustrated by the community reading its local news, witnesses receiving common summons to appear before the court, voters setting out for the duties of election day, church members anticipating the service of their organization, or a people considering the disseminated announcement of its battles or of its diplomatic adjustments. The assemblage must be socially grouped, though not congregated; and the congregate must be an organization as well as a "company." In both kinds of group the essential factor is integration of a psychological kind.

This distinction needs to be justified. We may properly be asked to demonstrate (1) that physical presence or absence is indicative of a true psychological distinction and (2) that the two kinds of grouping possess a "psycho-social" character.

A. *Comparison of the Congregate and the Assemblage*

In reply to the first challenge it should be explained that physical grouping is only a means to, or a symptom of, the social tempering of the individual. In the convention, or the public

[11] Bentley, M., *Amer. Jour. Psychol.*, 1902, xiii, 269.

[12] *Grex* and its derivatives, *gregal, aggregate, congregate, congregational,* etc., are convenient terms for this technical usage. Likewise we may employ *assemble, assemblage* and *assembled* to describe the non-congregated forms of grouping. The word "sympathic" is useful in the description of the assemblage.

[13] Compare Ross's account of the uncongregated "public" (*Social Psychology,* 63 ff) and Wallas's conception of the "great society" (*op. cit.*).

lecture, or the class room, or in the press of a street accident, social relations are laid upon a perceptual basis. The sight and the sound of the speaker or of the instructor or of the injured man, the sight and the unanalyzed sound of the mass or of the audience, the smell, the contact, the heat, and the effort of the individual to maintain his position, taken together with the organic processes which these perceptions arouse, have a profound *social* significance. The significance is revealed by the fact that—as the phrases run—the crowd 'forms,' the audience 'settles' and 'is moved,' the beholders are 'impressed.' In the non-congregated assemblage, on the other hand, the social grouping is conditioned in a very different way. Everyone knows the intimacy and warmth of a printed reference to one's self and one's affairs. The reader of the personal note is vividly aware that his neighbor or his county or his city is perusing the paragraph and passing judgment upon him. At such a time the individual is, in a social sense, very much in the "presence" of his fellows. But the total state and temper of his mind are determined, not by perceptual matters (the paper and the print are only symbols, which are represented in the background of consciousness) but by imaginal representations, emotions, and thoughts. And as the consciousness of congregated and assembled members differs on the perceptual or apprehensive side, so also does it differ on the executive side or the side of action. The response to other present members is different from the response to absent persons whom one regards, at the moment, in a social relation. I am tuned for action in one way when I read in my morning's mail of my appointment to an international committee, and in another way when I actually meet my *confrères* and set to work. The one relation is more passive, the other more active. The temper of the members of the one sort of group, the congregate, is expressed by the phrases "we hear," "we approve," "we dissent," "we will do"; of the other sort, the assemblage, by the phrases "I am considered," "I am condemned," "I belong," "I agree with the proposal." In the one, the main object of reference is the group and its interests; in the other, the place and relation of the individual, considered as a *member* of the group. In the congre-

gate, the main object of individual attention and interest is the group; in the assemblage, it is the relation of the individual himself to the group.

Two qualifications are called for. First, not every person in the congregate or the assemblage is necessarily a member, *i.e.*, is "groupish" or "crowdish' or "clannish." Individuals may be "lost" or "absorbed in thought" in the mass, or indifferent to exhortation or to the bonds of nationality, of kinship, and of local affiliation.[14] Secondly, like all distinctions which create adjacent or neighboring classes, the two types are not always to be readily distinguished on the basis of such differences as have been pointed out. There are cases of the border-line. Family bonds may, when the members are for a time separated, be represented by a conscious reference akin to that of the congregate; and on the other hand, the audience which is asked to consider its civic duties may bear the appearance of an assemblage.

Neither qualification really violates the principle of the distinction. The first only goes to show that we cannot answer for every person physically present in the congregate and for every person brought under social pressure in the assemblage. Its positive value lies in the demonstration that mere propinquity and isolation are the inducing conditions, not the essential characters, of the classes in question. The second qualification merely warns us that we must not so rigidly fix the lines separating adjacent territories as to endanger the *status* of localities lying upon or near the common boundary.

Further discrimination among the groups which represent the forms and phases of mental dependence must wait upon an agreement as to the conditions of social "influence" and "dependence." We have spoken of the physical presence of other persons and of the knowledge of common interests as determinants of the minds of members in a social group. Let us inquire now in what sense these circumstances may be regarded as falling among the *essential* conditions of mental integration.

[14] *Cf. The Audience*, p. 48 below.

IV. The Conditions of Mental Process and Mental Function in the Individual and in the Group

All the sciences seek to add to the description and classification of objects brought under their observation a definition of antecedents and causes. In this sense, science is explanatory. If the atomic weight of an elementary substance varies, or the spectrum of a star shows a new line, or if the offspring bears unequal resemblance to its parents, the appropriate science attempts to name the conditions under which the atomic weight varies, the new line appears, or the offspring inherits parental characteristics. In the same way, psychology has discovered in its observation of mental processes that these processes are conditioned by changes within the organism, notably within the nervous system. So invariable has this fact of bodily condition appeared that the psychologist has come to regard the empirical principle of psychophysical dependence as fundamental to his science. The more immediate physical conditions of mind lie within the brain. They are determined in two ways; by stimulus and by disposition or tendency. Stimulus indicates that the functions of the nervous system are determined by an outside agency (either within or without the body); disposition or tendency indicates that neural functions are determined by the residues of earlier function. The commonest forms of the latter are known as impressional, associative, determining and habitual tendencies, and general cortical set. Both kinds of bodily condition are, as we may suppose, in constant operation during normal waking life; though the facts of perception are mainly to be explained by stimulus and associative tendency, passive memory and imagination by associative and impressional tendencies, emotion and action by stimulus and determining tendency, skillful performance by habitual tendency, and thought by dispositions of the determining sort.

If mind morphologically regarded is conditioned in these definite ways, we have to ask how the social psychologist is to conceive those determinations which account for, or underlie, the facts of what has been vaguely called the "social consciousness." As a matter of history, we must note that he has, as a rule, been in-

clined to disregard the terms of general psychology and to invoke instead a very different set of concepts. He says that the mind of man is "influenced" by other minds, that man is "suggestible" or "imitative," that one mind "rules" or "dominates" and that another mind "acquiesces." It is obvious that these terms do not rest upon the same empirical plane as those just discussed. A stimulus is a physical agent acting upon a receptor-organ and initiating there a series of concrete organic processes. The same cannot be said of "suggestion," when suggestion is used to account for the fact that the mob destroys or of "domination" when domination is alleged as the cause of the acts of the laborers' union. "Suggestion," "domination," and the others are,—until they are empirically defined,—sheer abstractions used as agents or forces.[15] They are precisely analagous to the faculties of the eighteenth century.

Now faculties of any sort are inacceptable as a means to scientific explanation.[16] What, then, is social psychology to substitute for them? What may legitimately be given as the conditions underlying the origin, the integration, and the performances of human groups? Put into other words, What do we concretely mean by mental dependence, when we affirm that "individuals tend to believe and to think, to feel and to resolve," in mutual dependence?

It is obvious that the mind of my neighbor is not to be added, as a condition of my mental processes, to the sober and authenticated facts of stimulus and disposition. If my neighbor speaks

[15] Illustrations of this use are to be found in L. F. Ward (*Pure sociology*, etc., 1903, 256 ff, 457 ff, in Ellwood (*op. cit.*, 283 ff, 288), and in Ross ("Suggestions are true forces," *op. cit.*, 13). A large part of the sociological writing which treats of "mind" and of "mental forces" and "mental agencies" is psychological in name only. The writers usually mean by "mind," opinions, beliefs, thought-objects, and the like. A good instance is furnished by a series of current articles on "The mind of the citizen" (*Amer. Jour. of Sociology*, 1915-16, xxi, 145, 383, 501, 634). Lévy-Bruhl's "collective ideas" are pseudo-psychological facts of the same order. Wundt says of "suggestion" and the other abstractions that "sie selbst viel mehr der wissenschaftlichen Klärung bedürfen, als dass sie zu einer solchen beitragen könnten." *Logik* (3rd ed.), 1908, iii, 480.

[16] For a discussion of faculties in general psychology, see below, page 111.

with the voice of authority and decision and so convinces me that I should attend the meetings of the Municipal League, my mental processes are set up, after all, just as they would be if I found a blight upon my fruit trees and decided to destroy the orchard. Auditory or visual stimuli and associative tendencies account for the perceptual part of either experience, and determining and habitual tendencies for the performance.

The only thing that is unique about the conditioning factors in social or mental dependence is the fact that the presence of other persons (in the congregate) or the assumption of them (in the assemblage) touches off *certain* dispositions or neural tendencies, giving to our "social" experiences *a certain kind of significance*.[17] The sight of the blighted fruit trees and the sight and sound of my persuasive neighbor are psychophysical events of the same order. There is not, in the one instance, the mere apprehension of an object, in the other, the operation of a subtle and mysterious force through the agency of which my mind is wrought upon by my neighbor's. Because of my constitution and my history the two things are differently apprehended, have different significances, and lead to unlike performances. The one object is the tree-to-be-cut-down-and-burned; the other is neighbor-M-whose-opinion-is-to-be-regarded-and-accepted.

The sociologist may indeed speak of "social forces within the mind" and of the "power of suggestion," provided he has work to be done and sets a value upon the means. But the task of the psychologist is primarily descriptive: he has nothing to say of values, whether social, economic, or political.

Now it is not by accident that the borders of social psychology are left undefined. In no one of the special branches of the science are the dangers of trespass and of transgression so great. And the reason is to be found by an inspection of the *objects* of

[17] The enumeration and the classification of the "social" dispositions and of the "social" significances furnish one of the special problems of social psychology. These things are later touched upon in special articles upon the "crowd" and the "audience."—G. H. Mead contends (*Psychol. Bull.*, 1909, vi, 401) that social conditions are as unique and as general as physiological conditions of consciousness and that therefore general psychology should be supported by parallel treatments of physiological and social facts.

which the social sciences treat. These objects are, for the greater part, *mental* objects,—but not *psychological* objects; mental in the sense that "mathematical" and "imagined" objects are mental.

The psychology of *process* leaves the psychologist no excuse for confusing his materials with the objects of the physical world. But at times he still confuses,—without the sanction of logic, to be sure,—these same process-materials with objects of other sorts. Many writers upon social psychology apparently assume that any object which does not belong to the physical order belongs, *ipso facto,* to the realm of mind. This is a mistake. To be specific we may lay it down as a general rule that one is not treating of mental processes and mental functions whenever one is concerned *either* with the formal organisations of society (the church, the club, the state, the court, the party, and the like) *or* with the products of mind (languages, works of art, opinion, beliefs, traditions, and other thought-objects), when and so far as these things are regarded apart from the fluent processes and functions from which they take their origin or derive their means of continued support. Once these extra-psychological objects are relegated from social psychology to "psycho-sociology" or to some other sociological or economic discipline, the problems and the methods of our own field will be enormously clarified.

V. Social Consciousness and Social Objects

The appeal to the physical concepts of "force" and of "resistance," to account for the facts of social interaction, is as crude as it is unpsychological. A subtler and a commoner way of approach is through "social consciousness" regarded as the condition primarily and universally involved in human relations. But this term is objectionable. There is no class or group of mental processes or of mental functions which can properly be called "social," just as there are no "social" conditions of consciousness to be added to stimulus and disposition. It is not consciousness that is social. Objects and events are social.[18]

[18] Wallas has distinguished (*op. cit.,* chaps. xi, xii) "thought-objects" and "will-objects." Contrast W. Fite's conception of a "mutual consciousness" (*Jour. of Philos., Psychol.,* etc., 1913, x, 367, 373). Mead has built up, in the

They are social when their meaning or significance implies more than one observer. An object or event whose meaning or significance implies no observer, or only one, is *asocial.* When I perceive my inkwell as a part of the furnishings of the desk or as a receptacle which I must fill, it is an asocial object. Regarded as a part of the desk's furnishings, it does not (except logically) involve me or any other observer: as a thing which I must fill, it implies me. But when I regard the inkwell as a cherished gift its meaning at once implies and includes my generous friend as well as myself. It is social. It is social also when its scrolled pattern is apprehended as the artistic achievement of a savage tribe. So too events. The horse-race, the battle, the solar eclipse, and the fall of night are asocial events when they are just happenings, either wanting reference to an observer or making reference to a single observer,—whether myself or some other. But if my horse is contending against B's, if the battle means men-fighting or the contest-of-nations, if the eclipse is an impressive event which human beings silently watch, or the fall of night an hour for the cessation of human labor, then the occurrence is social.

The 'implication of observers' calls for two comments. First, the implication is not a logical implication. It is in the object as perceived. The plurality of observers is a part of the object's meaning. The inkwell is object-scrolled-by-natives-with-a-common-inspiration just as really and directly as it is green-object or ink-containing-object. The socialized eclipse is the eclipse-which-we-are-observing. In the second place, the observer, whether myself or another, is not a logical abstraction. It is a part of the concrete meaning which constitutes the object. When the inkwell is a social object, it is product-of-the-tribe. When the letter which I take from the envelope is a social object it is the thing which speaks for my correspondent to me. The letter is socially constituted by being his-letter-and-my-letter.

spirit of Baldwin, a logically constructed social consciousness which involves "social selves" and the transcendental ego of Kant (*ibid.*, 1912, ix, 401). For the history and use of the terms "social consciousness," "social mind," and the like, compare Davis, M. M., *Psychological interpretations of society* (in *Studies in Hist., Econ. & Public Law,* Columbia University, 1909, xxiii, no. 2) : Ellwood, *op. cit.,* 329 ff.

As social meanings grow, the observers of an object or an event assume more and more the character of *partakers*. The social reference gradually migrates backward from the common focus of observation to the relations which emerge between or among the observers. More and more the observers *share* the object. The beginnings of social reference are probably to be found among mammalian forms below man,—and possibly also among certain of the insects. The object is already apprehended as the common junction of observations. Communication is apparently not yet established among the observers for the reason that the *partaking* reference is still wanting. Many of the collections of primitive men seem to rest near this level of socialisation; although language here comes in to strengthen the bonds passing directly from observer to observer and only indirectly through the common object.

Later, we shall see that this distinction between such human collections as are held together by convergent lines of reference meeting in the object and such collections as are chiefly integrated by lines of reference binding together the partakers of a common experience may be used to mark off the typical audience from the crowdish mob.

Having now dwelt upon the meaning of socialised objects, we may proceed with the qualification and description of these. They are apprehended by a great variety of conscious functions: they are objects of perception, of memory, of imagination, of thought and of sentiment. But however the plurality of observers is implied, the implication may be brought under one or another of three different types; presentative, empathic, and inferential.

The implication is *presentative* when the mental functions involved are either perceptual or ideational. In this case, the existence or the behavior of observers is immediately apprehended. The social object is presentatively implied when a colleague M enters my study and scrutinizes with me a new lot of prints. The prints are social. They are works of art which he and I are criticizing and approving. It is not necessary either that I should be "self-conscious" or that I should make my col-

league's mind the object of my attention. My attention to the prints, regarded as *our* object, is sufficient. The case is essentially the same when I merely greet my caller. He is an object which implies me. If he shows anger and threatens injury, his behavior becomes a new part of the social object. When I merely ideate or "think of" M the implication is unchanged. So long as he is an object which implies only himself or only myself the object is asocial: so soon as it sets some relation between us, it becomes social.

But the implication may be immediate in another way,—in the way of *empathy*. Whenever an object implies the valuation or the appreciation (approval or disapproval, sympathy or antipathy) of one observer by another, the object is social. Modern studies of aesthetics, made from the psychological side,[19] have attested the importance in artistic appreciation of this same principle of empathy (*Einfühlung*). The threatening storm, the smiling landscape, the upward-tending pillar, and the balanced cross are all alike physical representations of moods and emotions. The principle of empathic projection seems to be the same in socialised objects. My observation of an heroic act attaches me to the hero because I value his deed. The caryatid maidens under the font were socialized when Sordello came each evening to share in sympathetic silence their enduring labors.[20] In social as in aesthetic empathy the object tends to close the discontinuities of perception and idea. The beautiful object feels and thrills with the beholder: the socially valued object unites and unifies, through empathic appreciation, all those who share it.[21]

Finally, the socialized object implies also through *inference* a plurality of observers. I understand the intent of the engraver of cavern walls to express himself in pictures and hieroglyphs when I have inferred from his drawings the type of his mind and the temper of his cultivation, and just as we pass from the

[19] Lipps, Th., *Aesthetik*, etc., 1903, i, 96 ff: Santayana, G., *The Sense of beauty*, 1905, 44 ff.

[20] Browning, R. *Works*, 1893. (Riverside ed.), i, 203.

[21] Professor Calkins regards *all* consciousness as "self" consciousness, and *all* perception as "shared" or social consciousness. W. M. Calkins, *An introduction to psychology*, New York, 1901, 153, 170.

physical or the chemical object to its causes and conditions, so do we proceed by the mediating processes of inference from the "expressive" movement, or from language, law, or custom, to the mental processes and functions which produced it. Now, as in empathy and in presentation, our social implications are bound up with objects; only now, in inference, we pass beyond the primary object to centre our attention upon a derived object which it is proper to call "mental." But it must be carefully kept in mind that an object is not necessarily social because it is mental. The mind which we reach by inference to account for mental productions or expressions is an asocial object when it is observed by itself. It is social only when it implies also another mind. If I read a dead author to discover his ideational type or his knowledge of botany, I regard him asocially; but if I discover in him a revelation of human passions or a means of expressing my own moods and emotions, I regard him socially.

VI. The Properties of the Congregate

It has seemed to be necessary to interrupt our discussion of social formations for the purpose of making clear what we must mean by the *conditions* of social grouping and by *sociality* itself. Having discovered that we have no right to invent either a mechanics of social forces to mould and to socialize the individual or a special "social consciousness," where we have found empirically given only certain objects and meanings which arise under certain special dispositions, we may now return to discuss the types of formation,—first the congregate and afterward the assemblage.

We begin with the congregate and we seek a psychological principle of classification. All enumerations based upon convenience or common sense or sociological value must be carefully scrutinized before they are admitted under our classificatory rubrics.

Since it is the integration or organization of individuals (p. 10) which we have found to characterize the 'social' facts of psychology, we turn naturally to the phenomena of organization as the appropriate key to the types and kinds of congregate. The

most obvious means of distinction lies in the number of associated individuals. Thus the simplest kind of congregate would seem to imply the conjunction of two individuals; the most complex, the congregation of a multitude. But this appearance is false. The measure is quantitative. It does not rest upon the nature of mental functions. That the organization of two members may be of the closest and the most complex pattern is demonstrated by those private and sentimental alliances which include hundreds of relational bonds and which endure over long periods of time. At the other extreme, we may find in the street throng at mid-day a huge aggregate held loosely together by the simplest and weakest of temporary connections.

A. Grades of Integration among Congregates

Without attempting to supply all the grades and levels of organization in the congregate, we can indicate the gradual rise of integration by beginning with such all-to-all groups as appear in casual and unstudied aggregates of men in the new mining camp, the temporary settlement of pioneers, and the accidental conjunction of many persons seeking separate and unrelated ends (the throng).[22] Then we pass to those temporary and spontaneous gatherings whither individuals are drawn by a common object of curiosity;[23] thence to the ordinary heterogeneous audience gathered for an occasional discourse; thence to congregates of individuals rendered homogeneous by a common purpose or common dread or need or request such as a mass of laborers locked out of their shops or fugitives fleeing before fire or earthquake. The next level of integration includes still more closely organized groups. It comprises congregates which are led or governed. There is a spokesman to give expression or a leader to harangue, to initiate, and to command. Such groups are "polarized."

The next stage of social amalgamation includes groups which bear an external resemblance to the heterogeneous audience, but

[22] *E.g.*, the railway platform at train-time.

[23] *E.g.*, displays in shop-windows, the street fakir, a fallen horse, a damaged machine.

which really belong at a much higher level. This is the stage of the *selected and primed* audience, the meetings, *e.g.*, of religious, fraternal and social "organizations." These are designated as "primed" congregates because the formal organization (which does not here call for extensive psychological treatment) implies previous association and common interests, sentiments and needs. The gregal attributes of such meetings presuppose a tacit understanding which is expressed in various bodies by creed, constitution, declaration, or platform.[24] This kind of congregate, then, reveals very much closer mental organization than is to be found in the heterogeneous and temporary audience. Should we consider minor differences of degree at this general level of integration, we should have especially to regard the gatherings of such organizations as strive to forget individual concerns and to unify themselves by devotion to a common cause. It would appear that this extreme unification in the congregate is commonly produced under the stress of violent emotion and of vigorous priming. Thus religious zealots forget themselves in the common frenzy of the maniacal moment. But we must not confuse extreme unification with extreme organization. The former state arises through the loss of individualizing characteristics in the members; the latter state is one of unity in spite of variety. The mammalian organism stands high in the scale of living beings, not because its organs and functions are homogeneous but because they are, in spite of their diversity, wonderfully correlated and bent to a common end.

Neither does our principle of graded congregates permit us to set at the top such automatized unities as the military formation. Unity of function and harmony of arrangement are indeed attained; but only at the expense of differentiation among the members.

It is, doubtless, the maximal grade of congregation which is

[24] The psychological function of such formal organizations as the church, the "society," the club, and the political party is to prepare individuals for membership in the congregate and in the assembly. Parliamentary rules of procedure furnish an effective means of promoting the functions of the mixed congregate with a minimal degree of polarization (cf. Ross, *Social psychology*, 57).

sought in the Anglo-Saxon form of trial by jury. United for a specific end, the jurors are expected to ponder until they "are of one mind," despite the mental differences which mark them as men. Whatever the limitations of this system may be, we must look to organizations of this sort, presenting the greatest unity amid wide inherent diversity, for illustrations of our final grade of "all-to-all" congregations. There we may reasonably expect to find normal and temperate human beings exercising in moderation the general and primary functions of the mind.

B. The Process of Polarization

Nothing like specific description of the various all-to-all forms of congregation can be attempted in this place. One mark, however, must be noted before we can advance to the alternative, or one-to-one, forms.

I have spoken of the "polarized" congregates in which a spokesman or a leader appears. Both the temper and the functions of gregal collections are profoundly affected by the unique offices of a single member who serves as leader or speaker or spokesman. The process of polarization implies that the dead-level of a homogeneous congregate is being disturbed. The all-to-all relations are augmented through this process by a new set of one-to-all and all-to-one relations. The thronged aggregate becomes differentiated the moment one of its members calls for help or inveighs against delay in suburban traffic. Attention within the congregate acquires a common object, and thought and emotion receive a common expression. The aggregate is now knitted up into a much closer organization: it acquires new qualities as it reveals the distinction of mass and leader.[25]

It should be noted that the process of polarization, to which every unpolarized congregate is constantly exposed, is the result of two reciprocal conditions. One is the innate difference among

[25] M. Conway (*The crowd in peace and war*, 1915) suggests the apt name "crowd-exponent" for the member who merely expresses the emotions and desires of the congregate. He is "the trumpet of another voice." (Pp. 101, 113). The organizer, the inspirer, the director of the crowdish congregate, Conway calls the "crowd-compeller." (P. 89.)

the members which prompts one man to aggression and others to passive performance, and the other is the universal recognition of this difference by the members themselves. The "natural leader" or spokesman is a member who is perceived as a person to-be-attended-to-and-followed. The first condition serves for the establishment of the one-to-all relations; the second for the establishment of the all-to-one relations. The phenomena of settlement as well as the casual and local congregations of man, continually afford suitable conditions for the process of polarization.

A description of the polarized congregates and a statement of the special conditions under which they are organized are reserved for later treatment. Our general discussion will only call attention to the fact that the process of polarization depends in part upon the appearance and the performance of the leader, and in part upon the matter of his verbal utterance. This difference is, grossly expressed, the difference between oratory and logic. Physical presence, manner, voice and gesture are vehicles which bear a meaning to the mass of the congregate; and the words spoken are symbols of another kind which likewise bear to the rest of the congregate their significance and temper. While no psychological distinction between the audience and other forms of the polarized crowd is everywhere applicable, we may note that in general the audience is a congregate which is *predominantly* organized under the second set of conditions, the other forms *predominantly* organized under the first. Verbal meanings, apprehended in common by a group, coalesce and integrate the members; while the manner, bearing and movements of the leader augment that temper which it is proper to designate as *crowdish*.[26] In the audience, the meaning of the discourse tends to strengthen the individual relations of the mass to the speaker, who represents the topic; in the polarized mob, the significant conditions tend, on the other hand, to increase the interrelations within the mass, or the secondary pole, of the group.

[26] Pierre J. G. Cabanis recalls (*Oeuvres,* Paris, 1824, iv, 346) that Bernard of Clairvaux converted the German peasants by preaching to them in Latin, of which they understood no single word.

Strong interrelations among the members of the mass form the first and primary characteristic of the mob; strong individual relations between the speaker and the other members, the first and primary characteristic of the audience. Most polarized congregates of the one-to-all type partake at once of the nature of the audience and of the mob.

The polarized congregate naturally leads to the one-to-one groups, which make up the second large class of congregates. In fact, the one-to-one type of formation may be regarded as the limit of polarization. Within it the poles are similar: a second individual takes the place of the multitude. There still remain the phenomena of subordination, of unequal give and take, of common objects of perception, and of a reciprocal guidance of thought and conduct,—although the congregated mass has disappeared. Sociology, whose interest lies largely in the performances of extensive groups, tends to overlook this important form of social congregation. But to the psychologist these mental relations are of primary importance even though for him the social and sociological functions of the paired groups are left out of account.[27]

Extended comment upon the grades of one-to-one congregates may be left for independent treatment. The extreme degrees would seem to be represented by the casual intercourse of strangers and by those "primed" pairs whose rich systems of interrelation rest upon common experiences and frequent conjunctions enduring for years. We have already seen that the upper extreme represents also the highest degree of organization for the whole class of congregates.

VII. The Assemblage

Set over against the congregates we have the major class of assemblages. The psychological distinctions between those collections which are physically grouped and those which are not have already been drawn. There remains the task of deducing

[27] Compare Wallas (*op. cit.*, 241 ff) for the functions of "oral dialectic" and of the corresponding one-to-one assemblages which involve writer and reader.

the principal forms of the non-congregated or sympathic assemblage.

So deeply in man are engraved the effects of communal existence that he lives grouped a large part of the time when he is in physical isolation from his fellows. It was, presumably, not so much the physical absence from his fellows that led Alexander Selkirk to cry out against solitude as the realization that fate had cut off those mental affiliations which exist in the various forms of assemblage. The bare "consciousness of kind," of which Giddings has frequently spoken, represents the lowest order of the assemblage. The conscious meaning which bears it is expressible in the words "I-belong." On the side of numbers, one individual who apprehends himself as a member of a group represents the smallest assemblage. The physical absence of other members does not destroy the sympathic relation. The fact that one person, relating other observers to himself, is sufficient to form an assemblage will seem less strange when we recall (see p. 8 above) that in this kind of integration, the chief emphasis lies on the side of the member; while in the congregate it rests upon the group.

We have spoken of assemblages as set off from congregates by "distinctive means of formation, qualitative and quantitative properties, differential functions and diversity of products." Our grades of organization ought, then, to be based upon these characteristics. First, compare the lowest degree of organization, represented by a bare "I-belong" attaching to objects, with those highly organized assemblages of scattered individuals glowing with loyalty to a common cause. The first may be formed by any chance reference or incident which draws attention to the social medium in which the individual inheres; while that assemblage which stands at the opposite extreme demands, on the contrary, a specific means of arousing dispositions of great age and tenacity,—dispositions which represent a multitude of relations and which serve to identify the member with his group. The integration of the closer assemblages and of the closer one-to-one congregate is conditioned by seasoned and complex tendencies to neural function which are the precipitates and the residues of a vast number of previous "social" experiences.

As regards the distinction of the properties and functions of the loose and the close assemblage, we may note that the representation of the group-relation is made in the first case by a vague and ill-defined object which stands for "society" and, in the second case, by a clear-cut and individualized object,—one's people, one's land,—which could be confused with, or mistaken for, no other object in existence.

With respect to polarization, the assemblage may be said to present a state analogous to the congregate, save that the primary pole, which was, in the congregate, the individual leader or spokesman, is now the mass; and that the secondary pole, which was there the mass, is here the individual. In the assemblage the individual "belongs to" the mass very much as the crowd "belongs to," and revolves about, its leader or exponent. Moreover, the assemblage reaches its upper limit of polarization in the one-to-one or paired form and its lower limit in those emotional and ecstatic forms, especially those composed of mystical and idealizing natures, in which the individual is consumed by, and identified with, the social totality.

On the side of function, the "I-belong" reference serves at once as a refuge against isolation and as a gentle and mild censor inhibiting overt acts against the state and the community; but the passionate acknowledgment of identity with a race or a cause creates a principle of conduct which sets purposes, commands action, and determines the destiny of the member and of his group. Intermediate grades of the assemblage need only be suggested. Many of them fall under our conception of civic and private duty. They represent a large number of ways in which the individual regards himself as related to his kind. They serve in large measure to maintain parties and states, clubs, churches, and philanthropies. The occasional meeting in the congregate strengthens them and increases their integration; but they exist as unique organizations with properties and functions of their own.

VIII. Summary

"Social psychology" is an ambiguous term which has been applied to a wide variety of facts and problems. The special province which it indicates must be set off from general psychology, on the one hand, and, on the other, from sociology. When traced to their common source all the legitimate problems of social psychology are found to proceed from mental "dependence" or mental "interaction."

Since social psychology rests upon "interaction," the meaning of this word must be clearly and empirically determined. The determination begins with recognition of its three fundamental aspects; the human group, with its qualities and its functions, the individual regarded as a member of the group, and finally the products of social integration.

The first two aspects are regarded in the two primary classes of human collections, the *congregate* (resting upon physical conjunction) and the *assemblage* (resting upon the social apprehension of non-congregated groups). In the first, emphasis lies upon the group, which possesses unique properties and presents various degrees of integration; in the second, upon the individual, who is qualified by the apprehension of social relations.

The characterization of human groups depends, in large measure, upon the process and the state of polarization or differentiation. Polarization appears both in the congregate and in the assemblage, and in the one-to-one as well as in the one-to-all forms.

The alleged conditions of congregation and of assemblage and of their marks and functions must be concrete empirical conditions and not such abstract social faculties as suggestibility, mob-spirit, and loss of reason. Consciousness in the group is conditioned just as other consciousness is. Its peculiarity lies first in the unique significance or reference or meaning of its social objects; secondly, in the community of intent, purpose, interest and knowledge; and finally, upon singleness and unity in those functions which the group performs. To speak of a group-mind or of a super-consciousness in any other sense is to countenance either an abstraction or a myth.

THE CROWD

By Helen Clark

I. The problem.
II. Methods of observation.
III. Treatment of results.
A. Species of crowd.
B. The formation of the crowd.
C. Structural characteristics of the crowd.
D. Spatial and temporal qualifications of the crowd.

Within recent years there have been many studies of the crowd. Although some of these purport to be mental descriptions, most of them have little, if any, psychological value. As is often the case in popular psychology, discussion has centered about the unusual or the abnormal.[1] We find picturesque descriptions of revolutions and of mobs; but we discover few sober analyses of the sorts of crowd that are of common occurrence. Moreover, many of the writers who discuss the mind of the crowd are not psychologists, and they inevitably resort to gross and popular depiction. And finally, where the description of the crowd forms part of a sociological, ethical, or philosophical study, the character of the work as a whole is apt to flavor those portions which are advanced as psychological.

I. The Problem

The very conception of the psychological problem of the crowd, as it generally appears in social psychologies, is unsatisfactory to science. An opinion not uncommon among philosophers and

[1] Le Bon, G., *The crowd, a study of the popular mind,* New York, 1900; *The psychology of revolution* (Trans. by B. Miall), New York, 1913; Ross, E. A., *Foundation of sociology,* New York, 1905, 109-110; *Social psychology, an outline and source book,* New York, 1913, 69-76: Sighele, S., *La foule criminelle, essai de psychologie collective,* Paris, 1901: Tarde, G., *L'opinion et la foule,* Paris, 1904, 159-226.

sociologists is expressed by Durkheim when he says that the social-psychic phenomena which we call "social mind" have "an existence in themselves independent of their individual manifestations."[2] Sumner admits that "it appears as if there was a 'mind' in the crowd which was different from the minds of the individuals which compose it, . . . as if the crowd had a mystic power in it greater than the sum of the powers of its members."[3] These statements seem to imply that the association of individuals gives birth to a new being, an actual external force, a "collective self,"[4] or "over-soul,"[5] a gigantic disembodied consciousness of some sort which constrains individuals to act in various ways.[6] Such a conception may have a certain amount of poetic or practical truth, but it is of little psychological value.

Certain writers, on the other hand, claim that "no 'social mind' exists apart from individual minds,"[7] that "all purely psychical reciprocal operation comes to its fulfillment in the individual mind alone,"[8] and that there is no need of a "spiritualistic hypothesis" or the conception of some "imaginary agent" to explain

[2] Durkheim, E., *Les règles de la méthode sociologique,* 14ième éd., Paris, 1907, 19.

[3] Sumner, W. G., *Folkways, a study of the sociological importance of usages, manners, customs, mores, and morals,* Boston, 1913, 19.

[4] Durkheim, E., *Le suicide, étude de sociologie,* Paris, 1897, 348, 353, 460; *De la division du travail social,* 2ième éd., Paris, 1902, 100.

[5] "Before Sociology existed, philosophers conceived of psychic units or Oversouls . . . Hegel's historical method posits for each people a certain immanent Idea formative of its history. Such ideology . . . strains the concept of the 'general mind' beyond the breaking point. The philosophical current which led from Hegel had weighty results for social science. Through its effect upon Karl Marx, the modern 'materialistic conception of history,' or, as we may call it, the Sociology of the Economic Motive, has a genetic relation to the great apostle of the Abstract Idea. Modern Sociology has taken its cues from natural science rather than from philosophy, yet its deductive thinkers have not failed to play shuttlecock with the tempting opportunities offered by the 'general mind.'" Davis, M. M., *Psychological interpretations of society* (in *Studies in History, Economics and Public Law, Columbia University,* 1909, no. 2, p. 27.)

[6] Durkheim, E., *Les règles de la méthode sociologique,* 14, 15, 18.

[7] Davis, M. M., *op. cit.,* p. 52.

[8] Paul, H., *Principles of the history of language,* (Trans. by H. A. Strong), New York, 1889, p. xxxvii.

social coöperation.[9] It is Wundt's opinion that, since the "Volkskörper" can be nothing but the bodies of the individual members, so the "Volksseele" must consist only of the separate minds of these members.[10] Steinthal regards such a point of view as too individualistic. It ignores the psychical unity of society by considering the social whole as atomized into individuals.[11]

In fact, neither conception is wholly correct. The psychology of the crowd is not a study either of individual minds or of an hypothetical over-soul. The first conception takes no account of the patterning and integration of the individual members: the second misinterprets the meaning of social organization because it makes of it a special kind of existence. The arrangement and interaction of parts, not alone the nature of those parts, gives a piece of machinery its peculiar characteristics. It is not enough to say that protoplasm is compounded of certain chemical elements. Neither is it necessary to introduce the activity of a "vital force." The characteristics of living matter depend upon its peculiar mode of organization and its manner of functioning. A perception is more than its mental elements; not more in the sense that there is an additional something (*e.g.*, a "quality of form"), but in the sense that the elements are integrated, and that the psychical processes involve, not only changes in the elements, but also changes in their organization. In a similar way, the mind of the crowd consists of a number of individual minds which bear to each other certain definable relations, and which exhibit, in their totality, certain unique group-characteristics. It is a necessary preliminary, then, to study the individual members who are the conscious elements of the crowd; but the final goal is the exposition of the patterning of these elements and the statement of the modes of their organization.

II. Methods of Observation

Students of the psychology of the crowd have not always used

[9] Lewes, G. H., *Problems of life and mind: The foundations of a creed* (first series), Boston, 1874, i, 146.

[10] Wundt, W., *Völkerpsychologie, die Sprache*, Leipzig, 1900, 8.

[11] Steinthal, H., *Begriff der Völkerpsychologie* (in *Zsch. f. Völkerpsychol. u. Sprachwissenschaft*), 1887, xvii, 256-64.

the best methods of selecting their materials. Some investigators have turned to literature, especially to historical reminiscence. Such accounts, however, are prone to treat exclusively of the unusual and the extravagant, and so to neglect the commonplace phenomena which first require description. Something is to be gained from casual observation of crowds or from introspection of one's own crowdish consciousness when with one or more companions. It is also possible to experiment with moderately large crowds under fairly uniform conditions, as in class or lecture. If data from a number of such experiments were compared, certain characteristics would undoubtedly stand out as significant. Laboratory experiments which do not require a large number of subjects are by no means out of the question. Under certain conditions, three, or even two, individuals may—for psychological purposes—constitute a crowd. The difference between the conditions of no-one-else-present and of some-other-person-present may be as significant as, if not more significant than, the difference between the presence of one other or of twenty or two-hundred. Even controlled investigations with a single subject are possible. One may observe introspectively the result of a proposal for action made by a group (*e.g.* of church members, neighbors, or associates in a club), and contrast it with the effect produced by the same proposal when made by a single individual.

III. The Treatment of Results

Even when valuable material is included in discussions of the psychology of the crowd, the general treatment of results is often superficial. It is not enough to cite a number of alleged characteristics of such groups.[12] A complete psychological description should include (a) the peculiarities of different kinds of crowd as contrasted with other social formations, (b) the conditions under which a crowd forms, continues to exist, and finally dissolves, (c) the distinguishing mental characteristics present at each stage, and (d) the modes of patterning of the crowd regarded in its temporal and spatial aspects.

[12] Ross, E. A., *Foundations of sociology*, 102-103; *Social psychology*, 54-56.

A. *Species of Crowd*

Objects or events apprehended by any conscious function may be called social when their meaning implies more than one observer.[13] A *social group* is any number of persons who are conscious of the same social object or event. If these individuals are congregated (that is, in physical proximity) the group is called a *crowd* or *congregate;* if they are non-congregated it is called an *assemblage.* Congregates, or crowds, may be divided into three classes. The group is an *aggregate* when there is no initial leader, when the members become congregated through the agency of a common social object or event. The *mob* is a crowd in which there is one initial leader and also a number of subsidiary leaders, members of the group who are so quickly and strongly influenced by the principal leader that they, too, exert a comparatively great influence upon the other individuals. In the *audience,* however, the influence of the leader is by far the most important, and the effect of the other members of the crowd upon each other is relatively slight.

B. *The Formation of the Crowd*

In order that any congregated group of persons may become conscious of the same social object or event, two conditions are necessary. The same stimulus or environmental factor must, at a given time, affect the same disposition or tendency in all individuals. The crowdish consciousness is, like thought and action, a determined consciousness. Crowdishness rests upon racial and individual predispositions toward specific organic functions. The sight of the flag, the announcement of election returns, the charge of injustice against the employer, throw into commission certain prepared functions in the nervous system which are responsible—since these prepared functions are common to the members of the group—for the temper and the activities of the crowd. The organic disposition will, of course, differ considerably in strength from individual to individual. The

[13] A more detailed discussion of this point is given on page 14 of this monograph.

disposition may be innate, as is the tendency to be terrified under certain circumstances, or acquired, as is the tendency to applaud when the national hymn is heard. In the second place, it is also necessary that all persons regard the object or event as social. A specific example may make this clearer. A number of individuals watching a Fourth-of-July celebration constitute the kind of crowd which we have called an aggregate. A certain part of their environment, the fireworks, influences all members. Although the individuals may differ greatly in other respects, they all possess the disposition to attend to, and to be pleased by, brightly colored lights in rapid movement. To each person the display is a social event, although the attribute of socialness may be manifested in different ways. Some may simply apprehend the presence of others. Some may be conscious of their companions' exclamations of delight. Still others may not only experience pleasure themselves, but may infer that the consciousness of their fellows is like their own. Finally, there may be appreciation and sympathy of one member for another. When others act as we act, and toward the same objects, we usually feel that they sympathize with us and approve of our conduct. If these conditions are fulfilled, the crowd continues to exist for a time, and its crowdish characteristics are intensified. As for the dissolution of such a group, we may allege several possible reasons. If the influence of one environmental factor is intense and of long duration, adaptation and shifts of attention occur, and the crowd breaks up. If an appeal is suddenly made to another common organic disposition of the members, the crowd rapidly disintegrates and another crowd of a different character is formed.[14] This occurs, for example, when a dog runs across the rostrum during an interesting lecture. The organization may also be destroyed when strong appeals are made to tendencies not common to all members. Finally, if the object or event loses its social character for a given individual, that individual ceases

[14] An anecdote of the French Revolution describes the rapid formation and dissolution of four crowds, each of a different nature, due to the effect of different environmental factors acting upon different tendencies common to all members. Tarde, G., *L'opinion et la foule,* 183.

to be a member of the crowd. If a party is being conducted through an art gallery, one of its members may become so absorbed in the contemplation of a picture that he is oblivious to the presence of others and no longer thinks of the object as in any way social.

C. *The Structural Characteristics of the Crowd*

When we examine the crowd from a structural point of view, we find that its consciousness and performance have certain peculiar characteristics. In general, there is an intensification and an exaggeration both of organic movements and of mental functions. In any of the three forms of crowd, consciousness may be predominantly emotional, cognitive, or volitional. Aggregates and mobs, however, are apt to be emotional or volitional in character, while in audiences the cognitive phases are usually more prominent. Some emotions, especially fear and sorrow, are produced or intensified by witnessing in others the expressions of like emotions. The instinctive tendency involved in this phenomenon would obviously have evolutionary value. As regards cognitive consciousness, it is evident that we tend to interpret objects as our fellows interpret them, to consider as real what others, by their behavior, seem to recognize as real, and to accept as true the ideas which our companions appear to accept. The basis of this tendency seems to be innate; but it is notably strengthened by experience. The presence of such a disposition would clearly be of benefit to the species. In speaking of volitional aspects of the crowd, we have tried to avoid the use of such indeterminate concepts as suggestion and imitation. In some cases, the copying of actions of other individuals is purely instinctive. We are apt to yawn when our companions yawn, or to take an attentive attitude when they are attentive. At other times, the individuals in the crowd are cognizant of a general need. If the action of some member indicates a way of satisfying this need, and if no better means occurs to the other persons, the latter are apt to copy the behavior of the first individual. When emotional or hysterical states occur, they usually induce a vague eagerness for action of almost any sort. This

nervous energy is directed into specific channels as a result of observing the behavior of a leader or of subsidiary leaders. Contrary to the opinion of several writers, the action of a crowd may involve a certain amount of reasoning. A jury is often crowdish, but we should hardly say that its members are absolutely incapable of rational thought. The emotional, cognitive, and volitional similarities of the members of a crowd may also result, in part, from the belief that one gains the approval of others if one feels, thinks, and acts as they do. The greater the number or the greater the power and prestige of other persons, the more, as a rule, does one seek their approval.[15] Though partially instinctive, this tendency is also the result of experience, since we learn that others have the power to reward or punish us.

D. *The Spatial and Temporal Qualifications of the Crowd*

Few attempts have been made accurately to determine the spatial and temporal configurations of the crowd. Some data concerning these points were obtained from the results of a class-experiment recently conducted at the University of Illinois.[16] This particular crowd would be classed as a mob, since its members were influenced, not only by the leader, but also, to a large extent, by the behavior of especially susceptible individuals. The students were given the impression that the experiment was upon the diffusion of gas, but the liquid really used was water. Each individual was asked to record his seat-number and the time elapsing before he smelled the new odor. Of the 168 men and

[15] Cooley, C. H., *Human nature and the social order,* New York, Chicago, Boston, 1902, 309: McDougall, W., *An introduction to social psychology,* Boston, 1909, 209-227: Ross, E. A., *Social psychology,* 147-194.

[16] A somewhat similar experiment was performed at the University of Wyoming. The report of results is as follows: "In fifteen seconds most of those in the front row had raised their hands, and in forty seconds the 'odor' had spread to the back of the hall, keeping a pretty regular 'wave front' as it passed on. About three-fourths of the audience claimed to perceive the smell, the obstinate minority including more men than the average of the whole. More would probably have succumbed to the suggestion, but at the end of a minute I was obliged to stop the experiment, for some on the front seats were being unpleasantly affected and were about to leave the room." Slosson, E. E., *Psychol. Rev., 1899,* vi., 407-8.

women present, 33 (about one-fifth) gave positive reports, while of 9 persons tested individually only one thought that he perceived the gas. When Binet questioned children in groups of 3, 4, or 5, they were more easily influenced by hints as to the answers than were other children tested singly.[17] One peculiarity of the mob, then, is its readiness to be influenced by verbal instructions. The results of the Illinois experiment showed, furthermore, that in each of the first 6 rows, more than 2 persons believed that they perceived the odor. Table I shows the shortest and longest time-intervals elapsing between the exposure of the liquid and the moment when the subject reported the perception of a gas. The number at the left end of each line gives the shortest time-interval in seconds, the number at the right gives the longest interval. For example, the first person in the first row who reported the perception of a gas did so 10 seconds after

TABLE I.

The Mode and Rate of Spread of Susceptibility in a Crowd

Rows		
1st	10	45
2nd	15	130
3rd	30	140
4th	40	180
5th	30	155
6th	85	155

the liquid was exposed, while the last person in the first row to give a positive report recorded the time-interval as forty-five seconds. As a second characteristic we might suggest that, instead of proceeding by regular waves, the influence of the leader first affects a number of especially susceptible persons in the

[17] Binet, A., *La suggestibilité*, Paris, 1900, 330-359.

order of the favorableness of their positions, and that the influence then radiates from them for a certain period of time. The spatial and temporal patterning of the crowd, as shown in Tables II, III, and IV, is also significant.

TABLE II

Temporal Optimum

Number of persons giving positive reports	Half-minute intervals					
	1st	2nd	3rd	4th	5th	6th
	6	*13*	6	2	2	4

As a third characteristic mode of patterning, we may notice that there are clearly marked spatial and temporal optima for the influences exerted upon the crowd. In this experiment, such optima were the second half-minute and approximately the eighth seat from the right in the third row. Each of the curves represented in the tables has one fairly prominent mode.

TABLE III

Spatial Optimum

Number of persons giving positive reports	Rows (counting from front to back)									
	1	2	3	4	5	6	7	8	9	10
	4	7	*8*	4	5	3	1	0	0	1

TABLE IV

Spatial Optimum

Number of persons giving positive reports	Rows (counting from right to left when facing the experimenter)															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
					4		4		4							
						3		3								
			2									3				
	1	1		1							2		2			
										1				1		1
															0	

It would be interesting to attempt a detailed classification of the varieties of crowd, or to describe a specific crowd in accordance with the plan of procedure already suggested. Such analyses, however, are beyond the scope of the present discussion. We have merely outlined a general method of treatment. If investigators were to employ such a method, we believe that an exposition of the psychology of the crowd might analyze and explain the facts without distorting them, and might, moreover, be scientific without seeming artificial.

THE AUDIENCE

By Charles H. Woolbert

I. Conditions of formation: all-to-all relations.
  A. General dispositions.
    i. Receptivity.
    ii. Homogeneity of interest.
  B. Special dispositions.
    i. Sophistication.
    ii. General cortical set.
    iii. Preliminary tuning.
    iv. Associative tendencies.
II. The integrated audience.
  A. Polarization: all-to-one relations.
    i. Presence of the speaker.
    ii. Effects of polarization; removal of inhibitions.
    iii. Effects of polarization; positive functions.
  B. Polarization: one-to-all relations.
    i. The speaker as an object.
    ii. Ideational meanings.
    iii. The speaker's relation to the auditors.
III. Summary.

While much has been written upon the psychology of the crowd, relatively little has been said of that particular kind of crowd which is commonly called the audience. We propose here to distinguish the audience from other sorts and varieties of human collection and to describe it in terms of its unique qualities and characteristics. The type of social group we have in mind is the company that is gathered together in an orderly frame of mind, at a place usually prearranged, with knowledge of the circumstances which have led to its convocation. The social group which we are to discuss is the audience gathered in church, at the town hall during a political campaign, under the Chautauqua tent, in Labor Union Hall, at a Fourth-of-July celebration, in the college chapel, or at the theater. We ask, then, "What characteristic mental phenomena do men exhibit when they come together under such circumstances?"

As a subject of investigation and experiment the audience is

almost virgin soil. However much the lay observer may have speculated concerning the audience and its actions, little has been done to subject this form of congregate to controlled conditions under the methods of the laboratory. As a consequence, what is said about it here must be chiefly based upon fugitive observation and reflection. Psychologists are at present devising ways and means of subjecting the audience to control and observation, and some day it will be treated experimentally; but for the present the best we can do is to describe what we casually know of it in psychological terms and from a psychological point of view.

An audience does not exist simply because one man is speaking to others. Ten men engaged in a colloquy, each contributing his part to the conversation, interrupting when the spirit moves or a lull in the conversation permits, hardly constitute an audience, even though at times one man may 'secure the floor' and draw all eyes in his direction. A company gathered around a table in oral dialectic may cease all other activities to listen to one person; but this does not necessarily make of them an audience, as we propose to use the term. The essential condition is an attitude on the part of the listener that causes him to set off the speaker as not of his 'situation.' To make an audience, there must be "polarization," the setting opposite of two objects. This it is that makes of a group an audience. Typically the audience and the speaker face in opposite directions: their minds take different bents: they are moving in opposing channels. Even though they may be strongly of "one mind" on some points, the very nature of the conditions is such as to place them at opposite poles.

In the psychological study of the audience we have to consider four kinds of relationship: (1) that of the whole group to itself,—the "all-to-all"; (2) that of the group to the speaker or performer,—the "all-to-one"; (3) that of the speaker or performer to the group before him,—the "one-to-all"; and (4) that of the speaker to each individual in the audience,—the "one-to-one" relations.

I. Conditions of Formation of the Audience: All-to-all Relations

In the study of congregated crowds the audience's apprehension of itself is a primary consideration. The set of mind in which people come together to hear a speaker or to witness a play very largely determines their behavior when the process of polarization intervenes. Most audiences gather under circumstances which are definitely determinable. Let us cite the most important. We can include them all under the general name disposition, of which we must recognize two main types; the general set of the persons who make up the audience, and a specific set that pertains to the particular occasion.

A. *General Dispositions*

i. *Receptivity.* The first consideration that affects the character of the audience is what may be called 'mental inertia.' Ordinarily men meet together in a yielding frame of mind. It is the exceptional instance when people gather in a public place with their backs bristling. They come to listen and to enjoy, to learn and to be inspired; and they willingly lay the burden of responsibility on the speaker or the actor. It is considered socially 'proper' to be amiable and yielding. Thus the polarizing power of the speaker is aided by the receptive attitude of the audience. It takes energy to oppose. Men have to be schooled to hesitate and to doubt; and when they do hesitate and doubt, there is always a special reason. The fixed tendency is to receive willingly and without opposition.

This acquiescing tendency, or "primitive credulity,"[1] as it has been called, is one of the surest aids to the speaker in causing the audience to form. A vast majority of the members in a congregate give themselves without reserve to the object of their attention,—that is to say, to the speaker. They are his to take, if he knows how to take them. They have come in an expectant frame of mind; their attitude toward the speaker is, at the least, one of tolerant respect, and they make it easy for

[1] Bain, A., *The Emotions and the Will,* 1876, p. 511.

him to control their mental processes once he gets their attention.

ii. *Homogeneity of Interest.* The second of the factors making for a general predisposition in an audience is similarity of habitual act and thought. Certain groups give allegiance to specific customs, taboos, rituals, ceremonies, traditions, and beliefs. All of these social factors rest on similarity of function and likeness of tradition. Units of the same cult or institution—church, lodge, political party, labor-union, neighborhood—have inclinations toward certain ways of thinking that make them easily consociated. They react to the same ideas, concepts, and beliefs. They do things according to the same ritual and ceremony. Their emotions can be reached by the same objects and in the same sequence. They notice and ignore the same sights and sounds. Their foreground processes wear a common aspect. Any social factor that tends to unite a human group in every-day life makes of it an especially homogeneous audience and also impresses upon its members a fixed disposition toward subsequent union.

B. *Special Dispositions*

i. *Sophistication.* According as we are or are not habituated to congregating we bring to the congregate dispositions that affect materially the experience we undergo. Persons who are accustomed to attend meetings get into habits of behavior that are quite different from the habits of those who congregate but seldom. The city-bred are usually 'audience-trained,' especially those who haunt the theaters and the picture-shows. They applaud more freely and from much more obvious incentives than does the countryman. They have a way of following more slavishly certain traditions of the audience. They are sophisticated. They know just what to do when the flag is flashed upon the screen; how to greet the national anthem; how to react at the mention of a political favorite or a pet fallacy. Aristocrats of one kind and another, especially academic and moneyed, are more reserved in their responses. Members of deliberative bodies feel the necessity of proving that they are deliberate; the voting delegates at a convention can be stampeded much less easily than

the non-voting galleries. Regular attendants upon the services of the church come to meeting with an entirely different set of mind from those who attend only by exception. Repetition of the congregating experience is important, then, in fixing the temper of mind under which the audience gathers; for it sets up habitual tendencies (p. 10, above) which play their part in the social significance of our kind of congregate.

ii. *General Cortical Set.* When an audience comes together with definite intentions and expectations, the pattern of perception and feeling is already determined. When we know that we are to listen to a political speech, our set differs from the set under which we hear a university lecturer discoursing on political science; and the difference is still greater between the tuning for a political meeting and for a religious service, for a gathering of farmers and the convocation of a collegiate faculty. Once we are prepared for a given occasion, we are easily integrated, provided only the occasion yields what we expect.

iii. *Preliminary Tuning.* After the audience is assembled it is influenced in its thinking and behavior by the immediate surroundings. The sights, sounds, smells and temperature of a public hall add to the individual's predisposition to become a part of the audience. The perception of a platform, a pulpit, or a proscenium brings a sense of being-in-a-public-place-in-the-sight-of-others. The pews, the hard chairs or the theater seats add an effect of their own; "storied windows," "dim religious light," music, the bustle of fellow-members moving to their places, the presence of judge and court-officers, the heat of the tent and the smell of crushed grass, the pressure of narrow quarters;—all these things tend to add to the individual's realization that he is 'out among others.'

Again, when the individual perceives that he is among friends, his behavior is appropriately affected; when he is among strangers, it is different. It is, we may suppose, for this reason that urban audiences are more demonstrative than rustic audiences. The former feel no restraint in the presence of a company made up largely of strangers; while the man in the rural audience ordinarily can call everyone present by name, and he is influenced

accordingly. We are chary of displaying our emotions and impulsive acts to those whom we expect to encounter on the morrow.

Once more, the size of the audience plays a part in determining the disposition with which its members listen. The greater the number of persons present, the greater the likelihood that they will represent conflicting customs, inhibitions, and modes of acting. The smaller the group, the more likely are they to represent some common interest growing out of social homogeneity. Men in large groups feel that there must be present a large diversity of opinion and purpose. Men in small groups are likely to infer a basis of unity or actually to apprehend it.

iv. *Associative Tendencies.*[2] A special agent in affecting an audience actually congregated is found in the trains of association that may at any time, through chance or circumstance, focus the attention of a group upon a given set of objects. During a religious revival the congregation holds in readiness a set of associative tendencies quite different from that possessed by the same group at other times. When the political campaign is at white heat, the crowd at the rally possesses a different set from the same company gathered in the Chautauqua tent when political issues are not in the air. Crises likewise dominate the perceptual attention: they force their way into the foreground of everyone's thinking. A catastrophe, a horrible crime, a political victory, a scandal, a national holiday, or a long-looked-for event brings men together primed in a way quite different from ordinary occasions.

II. The Integrated Audience

Thus we have found several factors that prepare the minds of the audience before they are affected by the speaker. Let us note the first effects of these predispositions,—the 'frame of mind'

[2] "Anything that makes for the impression of two stimuli, during the conscious present, will also serve to establish an associative tendency between them; so that the recurrence of the one, whether as perception or idea, will be likely to arouse the idea of the other." Titchener, E. B., *A text book of psychology,* 1909, 384-5.

that is induced by them. The various sets when brought into contact with the objects perceivable in the congregation create a social significance, chiefly a knowledge of the presence of others. When we sit in our pew or seat, both the foreground and the background of consciousness are occupied by processes that are efficient in providing acceptable social behavior,—conduct that will bear the inspection of others. This means that the processes dominant are those that condition the social factors of custom and taboo. The taboos are especially important. Their principal function in every-day life is to furnish the individual with a body of inhibitions. These inhibitions protect him against behavior that might be looked upon as socially unacceptable. The individual believes that, without these inhibitions, he does not appear to advantage in the presence of his kind. These restraining impulses are the most characteristic manifestation of his psychophysical set when he finds himself to be a part of a congregate. Thus the attention of the individual member of the group is directed outward toward other members. His foreground processes are taken up with perceptions and emotions relating to those around him. The situation can be represented by the following figure (1):

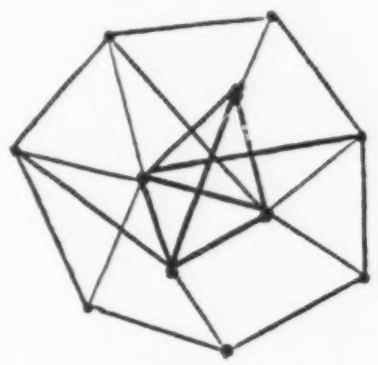

FIG. 1

To appreciate the social temper of the audience, it should be contrasted with the temper of the individual as we find him relatively free from the influence of the congregate. Every-day, uncongregated behavior is chiefly actuated by a few fundamental instincts. It is conditioned by impulses toward self-protection, self-aggrandizement, physical repulsion and attraction, revenge, helpfulness, and tender feeling. We are speaking now of the

individual when he is relatively free from social pressure, when social restraint is at a minimum. Under such circumstances, his characteristic attitude is much the same, no matter what his social position and irrespective of 'social' sets and tendencies. He wants to live on in the world, to be prosperous, to get away from the unpleasant, to take to himself what he likes, to put down his enemies, and to care for dependents. These are among the forms of behavior that most characteristically excite the emotions and dominate the activities of the uncongregated individual man; and it is well to note that actions released by these impulses are, in general, more aggressive, more vigorous, and often more sudden than those which grow from more highly socialized impulses.

A. *Polarization: The All-to-one Relations*

i. *The Presence of the Speaker.* We come now to the next stage in the experience of the audience. The members have gathered; and they are attuned by a wide variety of general and special dispositions. They are ready for something to happen. They await the speaker. They are primed for his coming. He enters: he becomes the object of attention: all eyes are directed toward him as he takes his place. Polarization has begun, though his mere presence is not sufficient to break the social connections that were laid before he appeared. The individual members are therefore still alert to the social significance of their surroundings.

Next, the speaker rises and begins his address. A change comes over the auditors. Polarization proceeds. The new relations may be represented by the following figure (Fig. 2), in which the long lines represent the individuals' apprehension of the speaker. Note that the interconnecting lines are still present, though they are lighter than in Figure 1. This means that the social objects are less vivid and significant than they were before the object on the platform caught the eye.

ii. *Effects of Polarization: The Removal of Inhibitions.* When polarization is complete and the art of the speaker at its highest level of effectiveness, the field of attention is narrowed and the processes in the foreground become very important for

FIG. 2.

the direction of thought and conduct. At the same time, the processes in the background drop out of function. Applied to the audience, then, this means that the speaker's thought, with its attendant motivation, occupies the field. The concentration of the auditor may even approach the state of hypnosis. The sharper and the clearer the concentration, the more is the audience relieved of the inhibiting processes that were represented in the foreground before polarization began. And the first inhibition to go is—as a rule—that of the desire to appear socially 'proper.' When the hearer is lost in the words of the speaker, propriety is a matter of remote concern. Now when the credulous temper, the appropriate surroundings, and the speaker's message are rightly coördinated and harmonized, there is no limit to the distance to which inhibitions may be driven, and no practical bound to the extremities to which the individual can be induced to go in following his more asocial impulses. Mobs can be induced to "seek, burn, fire, kill, slay," although the indi-

viduals in them, when aware of social surveillance (and in this we may include men's belief in an all-seeing eye), would be very unwilling to act a part, however earnestly they might wish to. The impulse hidden within is brought to the surface; the shell of social habit gives way for the expanding tissue of instinctive impulse; the socially-hardened crust is broken by the eruption of inner fires, long ago kindled in the race.

When this loss of 'social' inhibitions occurs, the figure changes to the following (3):

FIG. 3

Here the inhibitions are gone; attention is at high focus on the speaker and on what he is saying. The speaker has entered in reality into a one-to-one relation with the individuals before him. According to his skill in holding them is his power to prevent the inhibitions from coming back. If he loses his grip, the audience reverts to a state indicated in Figure 2. An inapt remark will bring about this result, or monotony of utterance, or a sudden interruption,—anything, in fact, which distracts attention

from the speaker's thought. Where the speaker is effective, he dominates the mental functions, leading his auditors into new paths of thought, stirring in them a variety of feelings, and arousing, at will, emotional and volitional impulses. But where the occasion and the speech are of such a nature as to enable the audience to retain its social armor, social inhibitions will play their part in action. Church meetings, gatherings on academic occasions, lectures before the community's "best people," seldom call for outbursts which shock the sensibilities. On such occasions the crust usually holds. But an appropriate speech delivered to an audience not so effectively armored, causes the shell to give way to the concealed impulses. On such occasions it is that conduct becomes crowdish and that the mob rules. Social conventions are forgotten. The fear of social ostracism or taboo is removed. Men in such a condition are not concerned whether or not they are social conformists. The idea of being a pariah has no fears for them; for social consequences do not enter into their thinking.

Men who are reserved under social inhibitions may be made to reveal an inherent coarseness when these social inhibitions are removed. Women who conceal their emotions when they realize that others are looking on, break into hysterical weeping or rage once they forget that they are the observed of observers. The man who says in his own mind—where no one else can hear him—that the objects of the mob's hatred ought to be 'strung up,' is just the man to take hold of the rope when he is made oblivious to social consequences.

From this point of view, then, crowdishness is in reality based upon isolation, not combination; upon freedom from the presence of others, not subjection to the will of the mass; it is a finding of the self apart from the rest, not a loss of self in a supposed crowd-personality.

iii. *Effect of polarization: positive functions.* Our doctrine of social release may be made to square with the observations of common sense by observing the different functions which an audience may be made to fulfill. We sometimes make the mistake of assuming that all audiences are gathered for one and the same

purpose. But the tasks of the audience are really three; (1) to comprehend, (2) to act, and (3) to think.

Most audiences are concerned with comprehension: most public speaking is of an informative nature. It is thus of a type that permits the background of consciousness to remain in effective operation. The inhibitions, therefore, which custom and social fear impose, remain in commission during an address which simply aims to clarify ideas. The audience that is polarized for this kind of appeal is in little danger of committing those acts which we designate as "displays of mob-spirit." Their crowdishness still allows them to keep pretty close to proper social behavior. (*Cf.* Fig. 2.)

The audience made to act, on the other hand, either emotionally or with selective movement, is further removed from its restraints. Such audiences do those untoward acts that we call unnatural, uncontrolled, reversions to savagery. It is the performances of the executively-functioning audience that are supposed to exhibit that hazy and mythical something we call the "crowd-mind," the "spirit of the mob." This type of audience is merely in the state represented in Fig. 3.

The third type of audience is functioning elaboratively,—thinking its way through a problem. Such an audience—when it really fulfills the conditions—has practically no concern for social restraints. Very few congregates actually get to this point, for the reason that seldom can a group be made to do real and sustained thinking. Only small groups, and those rather homogeneous, can be made to think. Representative types are the jury that really tries to solve its problem, and the class or seminary made up of trained students. This kind of audience, when it is thoroughly absorbed, can be represented by Fig. 4.

In its extreme form, this type of audience has pushed inhibitions so far into the background that in reality there is no audience left. What we have is merely so many individuals pursuing their independent ways. When a student in the class-room becomes really absorbed in the problem in hand, he is likely to slip down on his shoulder blades, spread his feet, ruffle his hair, and do any number of other unconventional deeds. Let the spell

FIG. 4

be broken, and up he sits, rearranges his clothes, and again becomes socially proper. His inhibitions come back into function. It is from this type of congregate that we get our reformers, our dissenters, our bolters. Having worked their way through a problem, they have no concern for what society thinks about them. It is worthy of note, also, that decisions made under such circumstances are more likely to last than those arising from comprehension or execution only.

The instances where social inhibitions are entirely removed are so rare that in most congregated actions we can trace the influence of objects of social significance. Especially are these effective in determining the mind of the audience when clear objects are discernible in the congregate itself. The sound of other persons laughing, the sight of men who look angry, the perception of handkerchiefs dabbing at red eyes, snuffling and sobbing, muttered ejaculations, sounds that represent protest,—all these add to the response which the individual gives to the speaker. When these perceptions are in harmony with the auditor's own thought processes and emotions, as induced by the speaker, they add to the tendency to function as the speaker desires. In this way, visual and auditory stimuli from other members of the congregate are added to those from the speaker. Accordingly, we may say that under such circumstances auditor and speaker are one, for they merge, they coöperate to influence the individual members of the congregation. While this condition prevails, polari-

zation is not complete; though the speaker may be very much the clearest object present.

So we may note, by way of summary, that no matter what the type of audience and no matter what kind of appeal the speaker makes to it, manifestations of crowdishness can be explained in terms of the presence or absence of those inhibitions which serve to protect the individual from being socially noticed and which help him to lose himself in the mass.

B. *Polarization: The One-to-all Relations*

i. *The Speaker as an Object.* When the speaker becomes the object of polarized attention, whatever he does has significance for the beholder and the listener. How he looks, what he does, how he sounds, and what he says, have meaning. Whatever effect he produces upon the auditors is the result of visual and auditory stimuli which are significant to the members. So that a discussion of the speaker's relation to the auditors necessarily touches upon a consideration of the relation of these stimuli to the meanings which the speaker bears.

As a visual object, the speaker begins to carry meaning the moment he appears. First, his personal appearance affects those before him. If he is tall and straight, his influence is different from that of the speaker short and bent; if he is rotund, he impresses men in one way; if slender, in another; the man with a Jovian-brow and an Apollo-like carriage means a thing quite different from the man whose head is small and who stands like a frightened fawn. Then his clothes also mean; the well-groomed man means one thing to an audience; the unkempt, unbrushed man means something quite different. The manner of dressing the hair, even the possession or lack of hair, the way of looking at the audience, the speaker's stride, his manner of taking his seat, of switching his coat-tails, of using his handkerchief—all these visually apprehended details have significance for the observer.

When the speaker raises his voice, the audience's interpretation of his visual appearance is likely to move somewhat into the background; though the way he 'takes the floor' after the intro-

duction or the opening remarks, still keeps the focus upon what is seen. Once his voice disturbs the hearers' ears with sound-waves, the auditors begin to place new estimates upon the object before them. Every sound he makes means; it means either what the speaker intends or something else; in any case, it is significant. The art of the speaker is so to control his voice and his vocal mechanism that what he says means what he intends.

Once the speaker is launched into his address, he mingles visual and auditory objects in about equal proportions. Continually he is giving the listeners sights and sounds to interpret, and the members have no alternative but to make interpretations of one kind or another. Everything the speaker does by way of posture, action, or facial expression is immediately given definite meaning. Every inflection of his voice, the volume and the rate of flow of words, phrases, and sentences affect the auditors' interpretation of what he represents. All these factors lead the auditors to place interpretations upon the object before them, and the object before them is, in large measure, a *social* object.

ii. *Ideational Meanings.* So much for the meanings that depend more or less directly upon visual and auditory stimuli. Let us go on to a consideration of the meanings that arise from the words that the speaker is using.[3] When the speaker so uses his vocal organs as to carry what are to him verbal meanings, the hearers attach to his words—rather, to the auditory sensations received—such meanings as their psychophysical set or predispo-

[3] The mistake is often made, especially in textbooks on rhetoric, of limiting the speaker's influence to this factor only; on the assumption that it is the speaker's ideas that count, not his manner. But a little reflection will show that there is no such thing as a speaker's ideas dissociated from his voice and physical action. Always the idea behind the voice and manner is conditioned by the physical objects of sight and hearing. One has only to study the effect of a well-staged and properly acted picture-drama to see the power of action to carry meaning and to impart ideas. Again, texts on oral expression and elocution do not pay sufficient attention to the importance of bodily action in carrying meaning to the observer. The only way an idea can get from the speaker to the hearer is by means of visual and auditory stimuli, and there is more meaning carried by what the eye sees than we commonly think.

sition compels them to attach. When the speaker is using words in a way that conforms to custom and to habitual usage, including his way of pronouncing and enunciating them, he may carry to all his hearers 'standard' meanings. If he departs from the normal or fails in his enunciation or if he uses unaccepted pronunciation, he carries only unintended meanings, or even makes it impossible for the auditors to grasp any meaning whatever. In the main, it is the full sentence expressing a judgment by which the speaker holds the attention of his hearers. He gets attention to his judgment by the right choice of ideas, images, and concepts, by the right choice of words, and by the right use of voice and bodily action. Thus by the proper choice of processes in his own mind, by the right choice of symbols in which to express them, and by the right use of stimuli to interpret them, he can be properly meaningful to his auditors.

We say that it is the speaker's mission to carry thought. But there is, in reality, no such thing as "carrying thought." Positively nothing goes from the person on the platform to the man in the seat but sound-waves and light-waves, which are the ultimate vehicles of meaning. Meaning is the only thing in any sense "carried." Not only is it true that every movement and every sound has meaning, but, once the speech is launched, lack of movement and silences also have meaning. So that from any point of view the speaker becomes meaningful once he takes the platform in the eyes of the congregated body.

iii. *The Speaker's Relation to the Auditors.* The speaker standing before his listeners represents purpose. What he contributes to the occasion is the idea of an end which he wishes to see advanced. On no other pretense has a man a right to come before others and to demand their attention. His problem is to convey this idea to his hearers with the accompaniment of the right feeling-tone. To this end, he must so combine, fuse, and integrate his meanings as to bring the idea into the foreground. The speaker's responsibility to his auditors is to make them (1) see a point, an explanation, or an illustration; (2) give some physical reaction to what he says; or (3) work their way through a problem, to solve a difficulty. The first kind gives us

the didactic, the expository, the descriptive address which aims chiefly to inform. The second type gives us the impressive, the stirring, the persuasive, the arousing speech,—designed to animate and to agitate, either emotionally or through overt performance. The third type is the argumentative address, which aims to set forth ideas in such a way as to make the hearer connect and relate them together in a new conclusion. Any appeal that influences an audience can be somewhere classified under these main rubrics. The speaker can take advantage of the dispositions of his auditors and he can polarize them effectively only as he appreciates which of these ends best fits the particular occasion.[4]

III. Summary

The audience is a social congregate of the polarized kind. Its integration implies (i) a special priming or preparation of its members, and (ii) the establishment of certain relations between and among the members when prepared.

(i) Like the action- and the thought-complexes, the audience is *determined*. Determination or preparation rests upon *dispositions* or *tendencies* (*cf. sup.* "A preface to social psychology," p. 10), which are in part racial and in part of ontogenetic origin. These dispositions may be distinguished by the terms *receptivity, homogeneity of interest, sophistication, general cortical set, preliminary tuning,* and *associative tendency.*

(ii) The specific relations of the audience derive, on the one side, from preparation or determination, and, on the other, from the presence and functions of a speaker or actor. The process of polarizing integration involves (1) the establishment of rela-

[4] From this study certain problems suggest themselves for investigation and for laboratory treatment. A few are appended here by way of suggesting a wide field for research. 1. The effect of distance of the speaker from the mass. 2. The spatial configuration of the mass. 3. The comfort of the audience. 4. The effect of different kinds of material for visual perception. 5. The feeling tone of halls and churches. 6. The size of the auditorium relatively to the audience. 7. Acoustics and polarization. 8. Traditions of halls and their effect upon the set of the audience. 9. The effects of variation in pitch, rate, force, and quality of voice. 10. The effects produced by varying the ratio of gesture to action.

tions (a) among the mass (see Figure 1), (b) between the auditors, or secondary pole, and the speaker, or primary pole (Figure 2); and (2) the partial or total dissolution of the (a)-relations under the process of de-socialization of the mass (Figure 3). In some (elaborative or thinking) audiences, there appears also a dissolution of the (b)-relations, which leads to a breaking up of the congregate (Figure 4).

Violent and excessive performances of the audience, commonly referred to a social "mob-spirit" or "crowd-mind" are, on the contrary, to be chiefly referred to the dissolution of the "social" (a)-bonds within the mass. The effect of this dissolution is a release of inhibitions which permits old and deeply rooted desires and impulses, of an asocial kind, to usurp the psychophysical organism.

Over and above the dispositions, the integration and the endurance of the audience rest upon a vast congeries of stimulus-factors which underlie the mass's social apprehension of itself, of the speaker, and of the speaker's message.

SENSATION AND ITS PHYSIOLOGICAL CONDITIONS

By Carl Rahn

I. Sensation and stimulus.
II. Sensation and central neural process.
III. Sensation and efferent neural process.
IV. Sensation and sub-cortical process.
V. Conclusion and summary.

The modern sensation as the psychical correlate of the process of stimulation of organs of sense might be traced from Plato's *αἰσθητόν*, through Locke's 'impressions' and Kant's 'phenomena,' to the fixing of the conception in the earlier experimental investigations of Weber and Fechner. The purpose of the present paper is briefly to trace this development, and then to point out some of the factors that are at the present time modifying or enriching our conception of the physical and physiological correlates of sensory consciousness.

I. Sensation and Stimulus

Let us consider, first, the sensation that is the psychical correlate of stimulus.

Woodworth[1] tells us that "sensation is that conscious content which is in closest relation to the physical stimulus." And Watt[2] writes as follows: "We have sufficient security, if we find a means of pointing out to each other what of the whole mass of experiences we call sensation and intend to study. That means we find in the sense-organ and in its stimulation. We may accordingly define sensation as the simplest parts or elements of those experiences that are immediately dependent upon the stimulation of a sense-organ. Such a definition accords well with the practice of an experimental science."—These statements are taken from two recent papers growing out of two very different endeavors,—the one a "revision" of imageless thought, the other a

[1] Woodworth, R. S., *Psychol. Rev.*, 1905, xxii, 2.
[2] Watt, H. J., *Brit. Journ. of Psychol.*, 1911, iv, 131.

re-definition of sensation; the one favoring the postulation of a category of non-sensory content, the other trusting chiefly to a reconsideration of the nature of sensory experience itself. This reference to stimulus as a factor in the definition would appear, therefore, to be of some significance since it is the only common element which is to be found in these unlike attempts at a statement of psychological problems in which the category of sensation is involved.

Historical antecedents of this correlation are to be found in Locke's conception of 'impressions' made upon the *tabula rasa* of mind as a result of the action of 'foreign things' upon the sense-organs, and in the Kantian phenomena that are induced by the action of the *Ding-an-sich*. . . . It is significant to note that while in Locke's mind the original problem appears to have been: "How do the 'ideas' that we find in our minds have their rise?", *i.e.*, a *Fragestellung* essentially genetic, it soon takes on an analytic turn both in Locke and in the empiricists after him. It becomes: "Of what are our 'ideas' composed?" We incline to the interpretation that Locke's *dictum* that all our 'ideas' come through 'sensation', originally had this genetic significance for him, when we bear in mind that he was particularly bent on laying low the hobgoblin of the doctrine of innate ideas. His was a quest after the origin of our ideas. . . . Locke finds that it is only through experience that the mind is furnished with the 'ideas of sensation.' Then, having gotten these, the mind elaborates them, and we have the rise of the 'compound ideas.' Finally, the mind looks inward upon itself and notes that it thus elaborates these ideas gotten from sense, and we have other ideas of a somewhat different sort, 'ideas of reflection,' *i.e.*, ideas of psychical processes. Such new ideas are our concepts of 'thinking,' 'recognition,' 'attention,' 'willing,' 'memory,' etc. These are not 'innate ideas,' for they too arise through experience that has its original impetus in the impact of outer things upon the sense-organs. The account is still genetic in character. But in tracing the genesis of the compound ideas Locke necessarily refers to the 'simple ideas' of sensation, and at this point the account tends to become analytic. . . . The elements in his treat-

ment that seem to have become the important factors for later development of psychological categories, appear to be (1) just this analytic turn in his method at this point and (2) the conception of point to point correspondence between the 'foreign things' and the 'impression' upon the *tabula rasa*. And while Locke's purpose was epistemological, and while this correspondence which he sought to establish between the action of 'foreign things' upon the sense-organ, on the one hand, and the content of consciousness, upon the other, might therefore be called an epistemological psychophysical correlation, he may, nevertheless, be looked upon, historically, as being responsible for the impetus given to an empirical account of consciousness that is to be arrived at by a structural analysis and by the correlation of the precipitates of the analysis with the objective stimuli in the physical environment.

Beginning with Hume, empiricists after Locke refined upon the concept of sensation as a psychological category and came eventually to define it as an elementary ultimate constituent of consciousness. In tracing the development from Locke's 'copy theory' of sensation, so much emphasized by his critics, we find that it becomes definitely 'static' when it appears in the philosophic systems of the German idealists who, following Kant, take all the 'life' out of it when they place it over against the dynamic aspects of mind.[3] This Kantian influence upon the content of our conception of sensation is manifest in those definitions of sensation which deny 'meaning' to it, and in those which in some way imply an abstraction from 'dynamic' aspects of mind, for meaning is the mark of the dynamic category of the 'understanding' in the Kantian duality. But more important for our present purposes is Kant's emphasis upon the point that the phenomena are in some way more closely correlated with the *Ding-an-sich*. In this, as in Locke's conception of 'impressions,' we have a forerunner of the sensation that is defined by Woodworth and Watt by means of a reference to stimulation of sense-organs. It is a conception that is basic both to Lockeian

[3] Cf. Rahn, C., The relation of sensation to other categories in contemporary psychology; *Psychol. Monog.*, 1913, xvi (No. 67), 67-68, 108-110.

sensationalism and to Kantian idealism, and is indicative of the common origin of both these branches of modern philosophy in the Platonic conception of mind.

Further development toward the conception of mental elements that are in some way correlated with the non-psychical 'stimulus' is favored by the earlier endeavors in experimental research in psychological problems. Physical science had its atom, and the scientist entering psychology carries old concepts and old habits over into the new field. Fechner's conception of measurement required static units both of the mental and of the physical for a statement of psychophysical correlations. Weber's pioneer work in physiological psychology aimed at a statement of fixed psychophysiological correlations in which differences in mental elements meant parallel differences in the anatomical bases of physiological processes. After Weber one sought to discover the number of elementary qualities. With quality as the basic attribute of the element, other attributes, such as intensity and duration are assigned to it, and it is in terms of these attributes that the element comes to be defined. The physical, physiological, and neurological correlates of these attributes were then to be determined. This fixing of special end-organs as correlates of specific sensory quales and the mapping out of cerebral sensory projection-areas, and the tracing of paths from end-organ to cortex,—this whole movement finds its most characteristic expression in Müller's formulation of the doctrine of specific energy. . . . These early empirical investigations fall readily under the conception of sensation as laid down in the idealistic as well as in the sensationalistic branches of modern philosophy; a conception of atomic sensory elements, dependent upon, or correlated with, the process of stimulation,—however much the meaning of "stimulus" might vary from time to time, signifying at one time the physical process that adequately calls out activity in the peripheral end-organ, at another time the excitation of the neural pathway leading to the cerebral sensory projection-area, and at still another time involving even 'nervous predisposition' as one of the 'conditions of a powerful impression of the nervous system.'[4]

[4] Cf. Titchener, E.B., *Lectures on the Elementary Psychology of Feeling*

II. Sensation and Central Neural Process

But if the early history of experimental psychology was such as to favor the development of the conception of sensation that we have just traced, it does not necessarily preclude a modification of that conception under the influence of other interests. Physics, physiology and biology did not rest content with atomic and structural categories, but have been indefatigable in working out other conceptions and modifying the old in the light of new facts and new interests. So, too, psychology,—for latterly problems of mind have come to be envisaged in new ways, and factors in consciousness have come to be pointed out which cannot always be satisfactorily correlated with 'stimulus.' In later development, the conception of sensation undergoes modification chiefly under the influence of two different interests, the one an interest in the relation of sensation to an 'apperceptive' or 'central' factor, the other an interest in its relation to a 'conative' or 'efferent' factor.

The first of these developments, *viz.*, the conception of sensation as dependent upon 'central' or 'apperceptive' factors, we have elsewhere traced at greater length.[5] Historically, it is closely related to the problem of conscious meaning,—the problem of 'cognition' of an older psychology. In this development we find two modes of procedure. On the one hand,[6] Woodworth, Bühler, Ogden and others, coming upon the fact of meaning and thought in consciousness, affirm that 'thinking' is not a ponderous presentation of peripherally and centrally aroused sensations, with

and Attention, 1908. Titchener points out that in the enumeration of the conditions of sensory clearness, "we began our list naturally enough, with a reference to the attributes and elementary relations of stimulus. It is clear, however, that we are breaking away from stimulus" (p. 194). In the end, however, he relates even nervous predisposition in some way to stimulus by subsuming nervous predisposition and the usual attributes of stimulus under a common head, *viz.*, "conditions of a powerful impression of the nervous system" (p. 204). And finally he tells us that "the ultimate condition of clearness at large—may be designated as nervous predisposition, predisposition of the nervous system and its sensory attachment."

[5] Rahn, C., *op. cit.*

[6] Woodworth, R. S., *op. cit.*: Bühler, K, *Arch. f. d. ges. Psychol.*, 1907, ix, 316: Ogden, R. M., *An Introduction to General Psychology*, 1914, 88.

their inseparable attributes, but that the essential nature even of perceptual consciousness is rather a non-sensory somewhat that is *sui generis,*—for which Woodworth even suggests a new class-term such as 'kulp' on the ground that "the 'thoughts' were gradually brought to light by the school of which Külpe was the guiding spirit."[7]

On the other hand, we find Watt[8] attempting to approach anew the problem of an adequate description of consciousness, not by developing new non-sensory categories and placing these alongside that of sensation, in order to do justice to the fact of conscious meaning, but by attempting a redefinition of sensation as a category of the conscious, and making a beginning—tentative, to be sure, but disclosing exquisite psychological analysis and originality in approach to problems—at a description of conscious complexes in terms of integrations of the attributive aspects of sensation. In this Watt is, perhaps, following a clue given by Külpe[9] at a somewhat earlier date—in which he came to the conclusion that the historic sensation, as hitherto defined by psychology, need not appear with all its traditionally inseparable attributes in the actual conscious pulse, but that certain of these may be abstracted from. According to Külpe sensory consciousness, or, as he puts it, 'consciousness of sensation,' is dependent not merely upon the 'sensation' (in physiological terms we take this to mean stimulation of end-organ and activity of afferent pathway to sensory projection-area of cortex) but also upon 'apperceptive' or central factors under the influence of the *Aufgabe.* As in Watt and Külpe, we find also in Aveling's[10] careful study a similar emphasis upon the factor of variability in the relative importance of the different attributes of sensation for the conscious moment. . . . There are differences, to be sure, in the standpoints of these writers, due to differences in approach

[7] Woodworth, R. S., *op. cit.,* 11. It may interest the reader to refer to Binet's modest and dignified claim to priority in this matter in *L'année psychologique,* 1911, xvii, 6.

[8] Watt, H. J., *Brit. Jour. of Psychol.,* 1911, iv, 129-203.

[9] Külpe, O., Versuche über Abstraktion, *Ber. I. Kongress f. exper. Psychol.,* 1904, 56-58.

[10] Aveling, F., *Brit. Jour. of Psychol.,* 1911, iv, 211-227.

to the problem, but they have this in common: while nothing is more remote from their respective points of view than an interest in the 'biological function' that sensation may serve, they all emphasize the fact that the actual character of the sensation as conscious experience—regarded, in the terms of Titchener, 'existentially'—is conceived to vary in some manner with conditions under which the given sensation occurs in consciousness. Not only does sensation undergo characteristic modifications with respect to its attributes in their dependence upon stimulus, but also with respect to their dependence upon such items as 'apperceptive factors,' 'integrative bases,' or attentional emphasis.

Thus we note (a) that in connection with the problem of cognition the fact of meaning has at times been abstracted from sensation and hypostatized as a 'thought element' that is the correlate of some central process, leaving sensation as the correlate of 'stimulus,' and (b) that at other times there has been an attempt to proceed otherwise by modifying the status and content of sensation and making the quale of sensory consciousness dependent in part upon modifications of stimulus and in part upon central factors.

III. Sensation and Efferent Neural Process

A further development affecting the content and status of sensation is the rise of the problem of its relation to motor response. . . . When the Golgi method made possible the formulation of the neuron-theory, a decided impetus was given to the physiological study of those neuronic systems that are the mechanisms of reactions to stimuli. Without going into its history we would mention at this point also the reaction-time experiment and the interests out of which it grew. At the same time we have points of contact in the larger biological interest in adaptation. Not only were gross structural adaptations to environment studied in the species, but more specifically, also the relative fixity and modifiability of certain typical modes of adaptive responses to stimuli.[11] The physiological mechanism that represents the struc-

[11] Jennings, H. S. *Jour. of Exper. Zool.*, 1905, ii, 448-472; McCracken, I., *Jour. of Comp. Neur. & Psychol.*, 1907, xvii, 262.

tural basis of such behavior was analyzed, and thus emphasis came to be placed upon the biological function of the nervous system. This was seen to be twofold: first, through it were preserved previously established modes of behavior, racial or individual, and secondly, through it were established new modes of behavior.[12] It was pointed out that when automatized modes of response "fail," then the whole process may be 'precipitated into consciousness,' thus making possible a reorganization through the mechanism of the learning-process.[13]

We are here concerned, of course, with only one of the many questions that arose in psychology when the 'reflex arc' became a center of interest. Ours is the question of qualitative modifications that are the correlates not of modifications of stimulus and afferent portion of the reflex arc, but of modifications of the efferent path. . . . Our inquiry here continues still in terms of the parallelistic method. We are not concerned with movement or with efferent processes either as *causes* or as *effects* of psychical events;—and if at times we refer to the latter as being 'conditioned by' or 'dependent upon' the former, we imply always a parallelistic correlation.

Now, it might appear, at first blush, that when under this influence consciousness comes to be considered not only in the light of its relation to 'stimulus,' but also in the light of its relation to the 'response' as well,—in other words, to the whole of the 'reflex arc,'— such a radical change would have a decided effect upon the conception of sensation. We do have a general shift in the conception of the psychical from the Platonic to the Aristotelian point of view; and while this involves implicitly a change in the conception of sensation, curiously enough this is not always clearly recognized, for notwithstanding this shift in the conception of the psychical, which we have indicated,—affecting either the general envisagement of problems, or the emphasis upon part-problems,—it yet remains true that it has not always influenced very markedly the conception of sensation in its char-

[12] Cf. Pawlow, I., *Erg. d. Physiol.*, 1904, iii, 177, and 1911, xi, 345: Herrick, C. J., *Jour. of Animal Behav.*, 1913, iii, 231-232.

[13] Angell, J. R., *Psychology*, 1908, chap. iii.

acter of a conscious existence. In an avowedly functional account we are still told that "the nature of the stimulus is thrown up in consciousness, as upon a screen." There is little implication here that the reflex adaptive tendencies that are presumably related to this stimulus in some way make a difference in the picture of the stimulus as it is thrown upon this 'screen' of consciousness. In it is revealed in pristine simplicity our Platonic and Lockeian heritage, in a conception of sensory consciousness that arises as a result of an 'impression' of 'foreign things' upon the *tabula rasa* of mind. Sensation is still *το αἰσθητόν* as of yore, and although we may be asked to consider the various 'functions' that this *αἰσθητόν* subserves in the biological economy, there is far less recognition here, than amongst the Platonizers, of the possibility of an influence of the 'function,' 'purpose,' 'end,' upon the conscious character of sensation; for while the platonizing intellectualistic trend in psychology may deprecate consideration of the biological function that sensation is supposed to serve, it has begun to recognize that the sensation is caught up in certain mental activities or acts, and that, descriptively, the character of sensation as conscious is dependent, in part at least, upon the specific activity in which it is caught up.

Historically, the point at which the biological influence did make itself felt in the direction of postulating a more specific dependence, in a parallelistic sense, of consciousness upon the 'response,' found its first most characteristic statement in the doctrine of the 'feelings of innervation' as a class of mental elements. But this doctrine in its original formulation fared badly. We would recall, only in passing, the treatment it received at the hands of James, whose argument is based chiefly on neurological considerations. Later criticism of the doctrine developed principally along four lines. (1) The fact that no consciousness is found correlated with stimulation of the motor cortex is often cited as an argument against the doctrine. (2) Then, again, it is urged that no biological utility would accrue to consciousness at that point in the neural arc. (3) The introspective warrant for such consciousness is questioned. (4) Consciousness is affirmed to be correlated essentially with 'centripetal,' 'afferent,' neural processes.

James'[14] criticism of the doctrine proceeded upon the assumption that such feelings of innervation would have to find some sort of localization at the point of the motor areas of the cortex. Clinical evidence denies the occurrence of consciousness in connection with stimulation at that point. Such stimulation, it is believed, gives rise to movement, but not to sensation.[15] . . . The doctrine is deprecated also on biological grounds. Assuming that feelings of innervation would necessarily have to be localized in the motor cortex, one has questioned the biological utility of consciousness in connection with efferent discharge at that point, for the fulfillment of the condition for the rise of these conscious processes, *viz.*, discharge into an efferent neural path, would, at the same time, be the condition for the release of the motor reaction. . . . But more cogent than purely biological or physiological considerations is the denial, on introspective grounds, of feelings of innervation as a special class of mental elements. Those who deny them assert that they cannot be found, and that the so-called feelings of effort, etc., are analyzable into kinaesthetic quales. .[16] . . Thus the psychological phenomena in question came to be regarded as being processes that are immediately correlated with stimulation of peripheral end-organs (in this case in muscle, joint and tendon) and of afferent neuronic systems. In other words, they are conceived as being essentially 'centripetal processes.'[17]

Notwithstanding the taboo, however, resting upon the doctrine of feelings of innervation, in its original form, some modification of it repeatedly finds formulation under some other name on introspective grounds. Our interest in these formulations here lies chiefly in the manner in which this factor is thought to be related to sensation. While referring only in passing to the physiological aspects of the question, Stout[18] avers, most em-

[14] James, W., *The Principles of Psychology*, 1890, ii, 494-500.

[15] Cushing, H., *Amer. Jour. of Physiol.*, 1908-1909, xxiii, p. xxvi (Proceedings of the American Physiological Society).

[16] Cf. Titchener, E. B., *A Text-Book of Psychology*, 1910, 169-170.

[17] Cf. Binet, A., *L'année psychol.*, 1911, xvii, 44.

[18] Stout, G. F., *Brit. Jour. of Psychol.*, 1906, ii, 1-15.

phatically, an introspective warrant for a distinction between cognitive and conative aspects of consciousness, and maintains that "there is an ingredient of the conative complex which has a privileged position, inasmuch as it communicates to the complex its distinctive character as conation." "This component is an unanalyzable immediate experience; it is immediately experienced in the same sense as pleasure or pain while they are being felt." Stout does not maintain that the conative factor is necessarily 'independent' of sensation, but he does maintain that it is not reducible to kinaesthetic or organic sensations, or images. The conative consciousness is not sensation but it may accompany sensation as affection accompanies sensation.

Again, there is Wundt. He may today deny feelings of innervation as correlates of efferent neural processes, but if we scrutinize his fundamental categories, we find in some of his classes of affective elements, such as his 'strain' and 'relaxation' as *non-sensory* constituents of consciousness, factors which for purposes of a descriptive introspective account of consciousness may serve very much the same ends as Stout's conative factors; for Wundt's categories find employment in his system to account, in part, for differences in conscious complexes that are very similar to the distinction that Stout makes between his cognitive and conative complexes. Also, like Stout, Wundt conceives this factor as an independently variable concomitant of sensation.

In Binet, likewise, we have a similar trend. He believes that "dès à présent, le point de vue sensationaliste est dépassé,"[19] and that there is need of some 'new conception' in psychology in order to account for what he calls the dynamic quale of the psychic life. This new conception he finds in the '*attitude*' which he regards as "an element as fundamental as the sensation and the image." He would make it a category on the same level with sensation and distinguishable from it by means of criteria very similar to those of Stout. In a descriptive psychology Binet's category would, we believe, serve very much the same purposes as the Wundtian categories cited above. Binet, not inclined to

[19] Binet, A., *op. cit.*, 45.

rest the matter alone on introspective ground, invokes certain physiological considerations by means of which he hopes to illumine his contentions, but which in the end serve only to cast a shadow of doubt over them in his own mind. He proceeds to correlate these mental attitudes with certain phases of motor activity. He tells us that one might say, with some exaggeration, that "toute la vie psychique . . . dépend de cette suspension de l'activité motrice; les actes réels sont remplacés par des actes virtuels, des attitudes."[20] This is the common observation of the functional psychologist, as when Angell[21] remarks that "the impulse to act, as such, we are hardly aware of, in any genuine sense, unless something impedes the impulsive movement." But after Binet has thus spoken of this mental attitude as an "element as fundamental as the sensation and the image," and after he has made this correlation of the attitude with impeded motor processes, he remembers the doctrine that posits consciousness in connection only with *'phénomènes centripètes'* and tends to deny it in connection with *'phénomènes centrifuges.'* The former have come to be correlated on the psychical side with the sensations and images as they are currently defined by a structural psychology. But these are for Binet merely 'static' somewhats that are thrown up into consciousness as upon a screen—and, in consequence, he almost denies his introspective verdict concerning the status of the *attitudes* as elements that are as fundamental as the sensation and the image.

Not our concern, however, the legitimacy of any of these categories. Suffice it that Stout, Wundt and Binet use strikingly similar terms in pointing out introspectively this element and its relation to sensation. Of these Stout and Binet make at least a general reference to the functioning of efferent and motor mechanisms as the physiological correlates of this factor that is affirmed to possess a peculiar quale different from sensation and image. While Wundt tends to deny the correlation with efferent neural processes—for these elements would thus become once more identical with the feelings of innervation—his feeling-

[20] Binet, A., *op. cit.*, 24.
[21] Angell, J. R., *Psychology*, 1908, 366.

elements other than the traditional pleasantness and unpleasantness are, in introspective terms, closest kin to the mental factors singled out by Stout and Binet.

It was left for Dewey,[22] however, to take a definite stand in asserting that the sensation is related not only to stimulus but to the response as well. Not that Dewey stands alone in his invocation of motor response, and efferent neural processes generally, in psychology.[23] We would recall, in passing, Ribot, James, Münsterberg, McDougall, and Judd. Dewey, with Ribot, James, and Münsterberg, invokes movement and efferent processes as a condition for the rise and occurrence of psychical processes; and with McDougall, Münsterberg, and Judd, he apparently holds that efferent neural processes are in some way responsible more specifically for the pattern or unity of the sensory and imaginal factors in the various complex mental formations. . . . It is not this kind of reference to response that interests us here, but rather the recurrent implication in Dewey that somehow psychical processes reveal *qualitative* modifications that must be correlated, on the physiological side, with the 'response of the organism.' But unlike Stout, Wundt, or Binet, Dewey contends that these modifications are to be conceived as integral factors of the sensory consciousness.

It is unfortunate that Dewey's whole conception of the nature of reality is couched in terms which do not readily admit of a comparison with other conceptions involving the postulate of a psychophysical parallelism. But in an historical survey of the conception of sensation in empirical psychology Dewey's conception must find a place. Taken from its pragmatist setting and restated in parallelistic terms, we find that this conception involves two sorts of reference to motor response which are not always clearly kept apart: (1) the dependence of a present sensation upon an already *consummated* motor response and (2) the dependence of a present sensation upon a response *about to be made.*

First, let us see what kinds of modification of sensory con-

[22] Dewey, J., *Psychol. Rev.*, 1893, iii, 357.
[23] *Vide* Bentley, I. M., *Amer. Jour. of Psychol.*, 1906, xvii, 293-305.

sciousness are to be conceived as dependent upon the consummated response.—Speaking of the organism's adjustment to auditory stimulation, Dewey says that "it is just as true to say that the sensation of sound arises from a motor response," *viz.*, the reflex adjustment of attention to the auditory stimulus, "as that the running away is a response to the sound." Indeed, Dewey would do away with the dichotomizing conception of stimulus and response as parts of a reflex arc and would replace it by the conception of an organic circuit in which the act determines the stimulus, and therefore the sensation, just as much as the latter give rise to the act. "What we have is a circuit, not an arc, or broken segment of a circle. This circuit is more truly termed organic than reflex, because the motor response determines the stimulus, just as truly as sensory stimulus determines movement."

With reference to our problem of the nature of sensation and its physiological correlates, it is at once apparent that the sensory experience is conditioned not alone by stimulation of sense-organs and afferent path, but also by certain selective mechanisms within the organism. The momentary sensory experience is what it is because reflexly the organism selected that particular stimulus. In the classical case of the child and the candle, there is a reflex attentional adjustment of the visual organ; this reflex response conditions, in part, the specific visual experience. The organic constitution of the child, moreover, is such that it reaches after the object; thus, once more, the act represents one of the conditions for the specific sensation of pain that thereupon rises in consciousness. Such a statement emphasizes the part that the organism itself plays in determining stimuli, and thus the sequence and integration of sensory experience. All responses of the organism,—whether of the specific type as the reaching and the shrinking, or the type preparing for the reorganization of the stimulus, as the attention response,—play a part in conditioning, determining or selecting the stimuli, and thus the sensations that are precipitated into consciousness. These responses, reflexly made, therefore determine in part duration, clearness, perhaps even intensity, of sensation, and also their sequence and pattern

in the complex sensory consciousness. The stimulus thus precipitated into consciousness in the form of sensation would therefore bear upon it the mark of the organism's reactions to it to date. This represents a positive contribution to our problem and must be accepted as descriptive of the facts even by those who may deprecate the teleological considerations that Dewey elsewhere introduces into his paper.

This dependence of the present sensation upon the response made a moment ago, as described by Dewey, is a dependence in the sense that the response made may become one of the conditions for the actual rise and going on of the present sensation; it is a durational, an intensive, or an attentional dependence. This partial dependence of the sensation with respect to these attributes, upon the motor response of a moment ago, is obvious enough; but we must go on and ask whether the sensory experience depends also qualitatively upon this response. If we turn to analytic psychology we find that it tends to answer this question by saying that such a qualitative dependence exists only in so far as we take into account the kinaesthetic quale that is fused or otherwise psychically integrated with the auditory, visual, or other quale in the conscious moment. This kinaesthetic quale is mediated by an 'afferent' mechanism set into operation by stimulation of end-organs in muscle, joint or tendon,—a mechanism essentially similar to that mediating those other quales with which this kinaesthetic quale is integrated. Thus the response just now made conditions concomitant sensory quale, but not the quale mediated by the action of the original objective stimulus upon the auditory, visual, or other sense-organ. Analytic psychology would admit, therefore, with Dewey, a dependence of a present sensation upon already consummated motor responses in the sense that these responses introduce modifications into the stimulation of end-organs;—modifications which are accompanied by parallel modifications in the sensation mediated by such stimulation, with respect to duration, intensity and clearness; concerning quality, however, current psychology appears, on the whole, to be cautious in admitting such a dependence, unless the fusional integration of the sensation attended to with the kinaes-

thetic sensations arising in the adjustment to the stimulus be regarded as such a modification.

If, however, we go farther afield we become aware, on the other hand, of the existence of a rather pervasive assent to the doctrine that the organism's past behavior, taken comprehensively, plays an important part in conditioning present behavior and the mental processes accompanying it. The study of the learning-process is essentially such a study of the influence of past activities upon present consciousness and overt behavior. The results, too, of Pawlow's school,[24] on differentiation of 'conditioned stimuli' may be appropriately cited as relevant. This school points out the fact that after the salivary reflex has been developed as a response to other than the original 'physiological' stimulus, there is possible a further differentiation within the field of the newly established, the 'conditioned,' form of stimulation, so that the salivary reflex that was artifically associated, say with auditory stimulation of fairly wide range in pitch, comes presently to be associated with a certain specific vibration-rate. This is achieved by controlling the order of the animal's motor reactions by means of a careful ordering of stimuli. This entire process of differentiation within the field of auditory stimulation has a parallel in the conscious development of finer and finer discrimination of differences in sensory quale. Ontogenetically, therefore, there is some evidence that the differentiation of specific sensory quales as conscious is conditioned in greater or less degree by the repeated responses of the organism.[25] Whether this process of differentiation through discriminative reactions is to be regarded as a dependence of sensory quality upon these reactions is therefore not a question of fact but of system.

Dewey's position, however, involves another reference to 'response'. The present sensory consciousness arises not only from the response that has been consummated, and that has, therefore, at the present moment become an historic fact, but the quale of this consciousness is also in some manner conceived to be a func-

[24] *Vide* Morgulis, S., *Jour. of Animal Behav.*, 1914, iv, 362-379; and Hough, T., *Science, n. s.*, 1915, xli, 415-518.

[25] *Vide* Rahn, C., *Psychol. Monog.*, 1913, xvi, (No. 67), 107.

tion of the response that is not yet an historic fact in the organism's career. This point is a bit subtle, but if we take into account Dewey's position as a whole we can perhaps restate it in the following terms: quale is conditioned not only by the selective mechanisms that determine the reflex attentional response to a given stimulus, and by the nature of the ensuing further stimulation and its afferent course, but also by the specific efferent neural path with which the afferent course is integrated. Such a statement does not imply that we have 'feelings of innervation' or 'conations' or 'attitudes' as correlates of efferent neural process;—Dewey himself deprecates the doctrine in his study of the consciousness of effort;—but it does imply that sensation is indeterminate so long as the response is indeterminate. The sensation becomes 'constituted' only when the response, too, is 'constituted'. Stimulus and response are "strictly correlative and contemporaneous"; the sensation depends upon both. "What the sensation will be in particular at a given time, therefore, will depend entirely on the way in which the activity is used. It has no fixed quality of its own."

The only interpretation that we can put upon these passages is that the sensory quale depends as much upon the 'response' that becomes correlated with a stimulus as upon the stimulus itself,—in other words, upon the efferent as well as upon the afferent portion of the arc. This interpretation seems justified in the light of a very much more recent paper of Dewey's[26] in which he points out that the object not only "exhibits what the organism *has* done, but exhibits it with the qualities that attach to it as part of the process of determining what the organism *is to do*." Unfortunately Dewey does not develop the conception further with reference to the nature of this qualitative modification that reveals what the organism is to do. But it is a conception that continually plays, in somewhat tantalizing fashion, into the hands of that other part of Dewey's doctrine that sensation depends upon the response just consummated. It is implicit also in the doctrine of the 'purposive nature of consciousness,' as well as in many of the formulations of the principle of dynamogenesis.

[26] Dewey, J., *Jour. of Philos., Psychol.*, etc., 1912, ix, 659 ff.

It can, however, be extricated from the various doctrines and restated as an hypothesis of psychophysical parallelism. If this is done we find that Dewey's conception involves a twofold dependence of sensation upon response; the one upon the response previously executed as actual muscular contraction, the other upon the response-that-may-be, the response-prepared-for, the response that is at present represented only by the 'set' of the efferent neural mechanism.

If this interpretation of Dewey is justified, this conception of sensation, as depending not only for its existence but also for its quale upon both afferent and efferent portions of the arc, must be distinguished from those in which sensation is correlated with the afferent portion only while the modification of consciousness due to the relationships of this afferent path with paths leading to the motor systems, is hypostatized as a non-sensory conative element,—a tendency that we discerned in Stout and Binet.

Thus we find that psychologically there are here two modes of procedure: (1) there is an hypostatization of the alleged conative or attitudinal factor in consciousness, as an independent element; or (2) this factor in consciousness that is attributed to the fact of the unitary functioning of the sensory and the motor mechanisms in the neural arc, is not thus abstracted, but is conceived as an integral part of the sensation.

These two procedures parallel very closely those which we found when the question of the dependence of the quale of consciousness upon the apperceptive or central neural factor was raised. There, too, we found that (1) sensation either continued as the correlate of stimulus and afferent path, while the factor of meaning or thought, that is revealed in the conscious moment, was abstracted as a new element by Bühler, Woodworth, and others; or else (2) sensation was conceived as dependent upon the cortical connections with other sensory systems as well as upon the afferent paths from sense organ to cerebral projection area,—in which case the actual sensory consciousness is conceived to vary as either of these portions of the arc might vary.

IV. Sensation and Sub-cortical Process

These historical notes suffice to indicate that the conception of sensation that developed along with the doctrine of specific energies continues in some psychological systems, while in others it is undergoing certain changes. Both lines of later development that we have been tracing have given rise to a modification of the conception in regard to the physiological correlates of sensation. Sensation is dependent not alone upon stimulus, afferent path, and cerebral projection-area, but also upon the system of neural paths with which the afferent impulse is integrated within the cerebral center. Two general types of modification of sensation, dependent upon the type of integration occurring at this point, had been distinguished in these different historical developments.

In the one, where the fact of meaning and thought became the chief problem, we have an approach to the view that variation in this meaning parallels the variation in the connections the afferent path makes with the sensory neural systems of the cortex. The activity of these systems is mediated into the process that is correlated with sensation and contributes to it the meaning or thought that is said to be carried by the sensation. Psychologically, this conception differs from the older associationism, for what is integrated in the sensory consciousness is not necessarily an 'image.' What we do have is essentially a sensation of the 'cognitive' type that carries the 'meaning' of the sensory systems that are functionally integrated within the cerebral centre. This meaning may or may not be given in terms of auxiliary imagery.

Similarly, the other development tended to emphasize the integration, within the cerebral centre, with paths that lead rather to the motor centres of the cortex. Such an integration may be paralleled in consciousness by the rise of a sensation of the 'conative' type. And this does not necessarily imply that we have consciousness correlated with, or located in, the motor centre. It does imply that the functional integration of the afferent mechanism with this motor centre determines the nature of the neural process in the arc just as much as does the afferent path;—and this in very much the same manner as the integration with the sensory systems contributes toward the character of the sen-

sation in giving 'meaning' to it without necessarily involving the rise of associated images in consciousness.

But besides these two types of modification of sensation distinguished thus far, we find a third type that is suggested by Herrick's interpretation,[27] in neurological terms, of Dewey's conception of the 'organic circuit.' Herrick conceives a sensation to depend upon the functioning of the sub-cortical centres through which stimulation passes, in very much the same way as it depends upon the sensory and motor systems with which the afferent path is correlated in the cerebral centre.

According to Herrick "there are no afferent tracts leading to the cerebral cortex directly from any peripheral sense organ or from any centre within the brain which is 'pure,' *i.e.,* devoted to a single sensory function. In other words, no simple sensory impulses ordinarily reach the cortex, but only nervous impulses arising from lower correlation-centres, where complex reflex combinations of various sensory systems are possible."[28] In Wilson and Pike's study of vertigo[29] we have an analysis of a specific case couched in terms of mechanisms essentially of this sort. They too point out that what is precipitated into the cortical activity is not a set of sensory impulses, but the disorganized reflexes that are involved in equilibratory activities.

Herrick then points out that the functional integration going on in the sub-cortical centre through which the afferent impulse is relayed in its transit to the cerebrum involves not only an integration with sensory centres but also with motor centres at that level. "From the standpoint of the cerebral cortex considered as an essential part of the mechanism of higher conscious acts, every afferent stimulus . . . is to some extent affected by its passage through various sub-cortical association centres, *i.e.,* it carries a quale of central origin." "But this same afferent impulse in its passage through the spinal cord and brain-stem may, before reaching the cortex, discharge collateral impulses into the lower centres of reflex coördination, from which incipient (or

[27] Herrick, C. J., *Jour. of Animal Behav.,* 1913, iii, 222-236.

[28] Herrick, C. J., *op. cit.,* 223.

[29] Wilson, J. G., & Pike, F. H., *Jour. of Amer. Med. Assoc.,* 1915, lxiv, 561-564.

even actually consummated) motor responses are discharged previous to the cortical reaction." Herrick is here interested in giving the neurological mechanism of Dewey's conception of the influence of the response upon the stimulus-complex. In so far as discharge into motor centres at the lower level brings about changes in the overt muscular adjustment, bodily attitude, or act, it is patent at once that the lower reflex response in its consummation "may in a literal physiological sense act into the cortical stimulus complex and become an integral part of it,"[30] in some manner like that described in our discussion of Dewey. But Herrick's exposition touches also upon the influence of the 'incipient response' at the lower level. The question arises: does this also 'act into' the stimulus complex of the higher centre? Apparently, yes. For he tells us that "sub-cortical elaboration of types of action system which ordinarily do not involve the cortex at all" may, upon occasion, "be linked up with cortical association processes and then come into consciousness in such a form as to suggest to introspection that they are all of a piece with the conscious process with which they are related."[31]

Thus interpreted and elaborated, this general conception of Herrick's would involve as one of its essential elements a parallelism between changes in synaptic relations in sub-cortical centres and modifications of consciousness. A modification of factors at the point of a synapse conditions a modification of neural impulses proceeding from that point to other, higher, centres. The sensory stimulus, in its passage to the cerebral centres, is affected by all the neural integrations that occur in the lower centres through which it is transmitted. In other words, the afferent path between receptor and cerebral projection-area is a variable factor. As the synaptic integrations in these lower-level centres vary, so will the neural impulse vary that represents the afferent stimulation for the excitation of the cerebral centre. More specifically, the lower-level integrations, involving both sensory systems and motor systems of the reflex type, are mediated into the afferent cerebral stimulation in very much the same

[30] Herrick, C. J., *op. cit.*, 233.
[31] Herrick, C. J., *op. cit.*, 232.

manner as are the associated sensory and motor cortical systems with which this afferent impulse becomes coördinated in the cerebral centre itself. All of these lower-level integrations must be conceived, according to Herrick, as contributing their quota of modifications to the cortical excitation, and thus to the conscious process that is correlated with the cerebral activity.

Herrick ventures the suggestion that the psychical correlate of these modifications of the afferent path is the affective quale of sensation. Indeed, the afferent impulse, in passing through the thalamus, may innocently stir up a veritable hornet's nest of racial motor tendencies and racial sensory integrations, which contaminate the afferent impulse and give to the innocent little sensation the character of emotion. The question, however, arises: whether that little sensation is still mere sensation;—and also the question: whether the fragments of imagery that the *Denkpsychologen* have discovered as the sensory concomitant of thought—where a single syllable is often the 'bearer' of the meaning of a complex thought-content such as the general plan of a philosophic system, revealed all in a single flash—whether this is merely a bit of sensory consciousness, or more than that. These questions we must leave for the structuralist and the functionalist to decide each in his own way.

V. Conclusion and Summary

The modern sensation as the psychical correlate of the process of stimulation of sense-organs may thus be traced from Plato's *αἰσθητόν* through Locke's 'impressions' and Kant's 'phenomena,' to the fixing of the conception in the earlier experimental investigations of Weber and Fechner. It is the sensation that crystallizes in the later Wundtian psychology: the sensation that is the correlate of the objective stimulus, as over against feeling which always has a 'subjective' reference.

But, today, even there where sensation continues as correlate of stimulus, we find that certain of its attributes are made to depend not upon stimulus alone, but also upon such central factors as 'nervous predisposition.'

The more recent developments, however, which we have traced

in this paper, are characterized by attempts to give us a conception of this dependence that will be somewhat more specific than this very general one of nervous predisposition. These attempts are bringing about changes in the conception of sensation under the influence of three somewhat different directions of interest: (1) an interest in the relation of sensation to apperceptive or central factors; (2) an interest in its relation to conative or efferent factors; and (3) an interest in its relation to lower-level neural processes.

In the first of these developments, we found that (1) sensation either continues as the correlate of stimulus and afferent path, while the factor of meaning or thought, that is revealed in consciousness, is abstracted as a new element by Bühler, Woodworth, and others; or else that (2) sensation is conceived as dependent upon the cortical connections with other sensory systems as well as upon this afferent path from sense-organ to cerebral projection-area,—in which case the actual sensory consciousness is conceived to vary as either of these portions of the arc might vary.

In the second of these developments, we find, similarly, either that (1) sensation remains the correlate of stimulus, while the alleged conative, attitudinal, or impulse factor is abstracted from this sensation and made into a new element; or that (2) this aspect of consciousness, while noted, is not abstracted as an 'element' and placed over against sensation, but is conceived as an integral part of it (Dewey). Whatever the warrant for these differences in systematic procedure, they all represent attempts on the part of a descriptive psychology to do justice to those aspects of consciousness that are not solely or immediately dependent upon modifications in the stimulation of receptors.

The third, and more recent, development is suggested by Herrick's neurological approach to the problem of sensation. Herrick emphasizes the effect of varying synaptic relations within the subcortical centres through which the afferent impulse passes on its way to the cortex, so that the lower-level activity is conceived as being mediated into the cortical process.

It thus becomes patent that contemporary criticism of the conception of sensation indicates an endeavor on the part of psy-

chology to come to terms with the conception at three points: in connection with the problem of conscious meaning, with that of conative or impulsive consciousness, and with that of affective or emotive consciousness. Whether all of those modifications of consciousness, however, that are conceived as the psychical correlates of physiological processes other than stimulation of the sense-organ, are to be regarded as qualitative modifications of sensation, or as something over and above sensation, still awaits decision. But this is not of primary importance. What is significant is the course that the criticism of sensation has taken.

Involved in much of this psychological criticism there is either explicit or implicit reference to neural mechanisms. Associationism is being replaced by some sort of conception of a functional interrelation of neural centres. Even though our knowledge of the neural mechanisms may be meagre indeed, we do have reason to believe that the factors that are integrated in cortical processes are in part the afferent path involving subcortically integrated neural systems, the cortical sensory systems, and the cortical motor systems. It is these factors that determine in some way the character of the sensation.

Psychologists interested in the thought processes have emphasized the 'meaning aspect' of the sensation,—affirming that it may vary from moment to moment and that these variations are in some way variations of consciousness that can be directly ascertained. To a lesser extent, the conative, impulsive, dynamic character of sensation is singled out by others and treated in very much the same way. But neither the meaning nor the impulse is necessarily given in terms of concomitant sensations or images. Unless they are hypostatized as separate contents, they are variously conceived as peculiar modifications of the sensation itself. In the third place, we have Herrick's suggestion which, upon careful scrutiny, reveals close kinship, psychologically, with the procedure just mentioned. Just as the integrated cortical sensory and motor systems may be conceived as giving meaning and dynamic quale, respectively, to the sensation, so Herrick apparently conceives the sub-cortical systems to contribute what he believes to be its affective or 'emotional' quale.

The questions whether feeling is to remain a content alongside of sensation, and whether feeling, meaning and conation are to be interpreted in some way as functions of sensation, do not concern us here. Only this: that the neural process that underlies the sensory process consists in an integration of various factors, each of which is conceived by these writers to modify, in its own characteristic manner, the sensation. In this sense not only the motor response that is immanent although not actually consummated, but also the past experience of the individual, and presumably the past of the race, may in some way modify the sensory process without the presence of auxiliary imagery. In this conception of sensation psychology frees itself definitely from the bonds of associationism, and through it also there opens the way to a new interpretation of neural function that will be at variance with none of the known facts of psychology or of neurology.

THE PRINCIPLE OF DYNAMOGENESIS IN PSYCHOLOGY

By Carl Rahn

I. Physiological statement: stimulus and movement.
II. Psychological statement: consciousness and movement.
III. Methodological implication: behaviorism.
IV. Criticism of the principle: physiological.
V. Criticism of the principle: psychological.
VI. Conclusion and summary.

I. Physiological Statement: Stimulus and Movement

James, writing of the principle of dynamogeny, says "Every sensorial stimulus not only sends a special discharge into particular muscles dependent on the special nature of the stimulus in question, . . . but it innervates the muscles generally."[1] And in so far as certain of these other muscles are directly responding to special stimuli of their own, their specific response may be augmented by this general innervation. It *may be* augmented; but Féré had also pointed out that not always is the effect thus *dynamogenic,*—it may be, at times, the opposite. James recognizes this when he uses Féré's results in connection with the law of diffusion; "A process set up anywhere in the centres reverberates everywhere and in some way affects the organism throughout, making its activities either greater or less."[2]

But in later psychological thinking 'diffusion' tends apparently to become 'diffusion to muscles'; and the effect of concomitant stimulation, which Féré had found sometimes to be in the direction of inhibition of the specific response and sometimes in the direction of its re-enforcement, comes to be interpreted as being always in the latter direction. And again, quite apart from the psychological facts revealed by studies of the effect of concomitant stimulation upon attention, which closely parallel the results of Féré, we find in Sherrington's differences between nerve-

[1] James, W., *The Principles of Psychology,* 1890, ii, 379.
[2] James, W., *op. cit.,* ii, 381.

trunk conduction and reflex-arc conduction a very relevant item. The peculiarity of the latter as compared with the former is that it does not reveal the one-to-one allignment of stimulus and motor response that the principle of dynamogenesis would demand.[3]

These several points may be urged against Baldwin's generalizations of the law of dynamogenesis. He tells us that "every sensation or incoming process tends to bring about action or outgoing process"[4] and "changes in the conditions of sensory stimulation of the nervous system always show themselves in corresponding changes in muscular tension or movement."[5] Diffusion is conceived as being necessarily diffusion to effectors and glands; and stimulation is thought of as being followed by an outgoing process that is necessarily tension producing. The fact of inhibitory effects noted by Exner and Féré is completely lost from sight. . . . And in addition we would recall to mind also the bearing of the fact of stimulus-threshold, originally urged by Stumpf[6] against the law of dynamogenesis as propounded by Baldwin.

II. Psychological Statement: Consciousness and Movement

So much for the physiological form of the principle of dynamogenesis. Our interest, here, however, is directed to its psychological implications. There are diverse formulations. The most interesting statements are those of James. "Consciousness is in *its very nature* impulsive."[7] "Movement is the natural immediate effect of feeling, irrespective of what the quality of the feeling may be. It is so in reflex action, it is so in emotional expression, it is so in the voluntary life."[8] Furthermore, if consciousness does not produce action, it is due to the inertia of the

[3] Sherrington, C. S., *The Integrative Action of the Central Nervous System*, 1906, 14.
[4] Baldwin, J. M., *Mental Development: Methods and Processes*, 1895, 166.
[5] Baldwin, J. M., *Dictionary of Philosophy and Psychology*, 1911, i, 302.
[6] Stumpf, C., *Zsch. f. Psychol.*, 1899, xxi, 78.
[7] James, W., *op. cit.*, ii, 526.
[8] *Op. cit.*, ii, 527.

effector apparatus: "There is an inertia in the motor processes as in all other natural things." But this restrictive inertia "obviously introduces no essential alteration in the law which the text lays down."[9]

Thus consciousness, whether on a parallelist or an interactionist hypothesis, is related to a nervous process of which the reflex motor response to sensory stimulation is the type. This formulation of the principle, stating a general relationship between consciousness and action, was followed, historically, by a veritable renaissance in psychological thinking, especially along educational lines. There was something, too, of the nature of an aesthetic appeal made by this formulation. It satisfied a sense of fitness. The rise of a pragmatist *Weltanschauung*, also, may have helped it along. But fundamentally it meant a break with the old way of looking at the problem of consciousness.

We have elsewhere[10] pointed out the fact that much of the early effort in empirical psychology was directed toward the correlation of modifications of sensation with modifications of stimulus. We also pointed out that this sort of endeavor fitted quite appropriately into the conception of mind that this early psychology takes over from philosophy,—a conception that, stripped of the metaphysical implications of various modern philosophies, reveals its origin in the Platonic conception of mind. In modern philosophy Platonism tends toward a dualism of soul and body, leading ultimately to the distinction of the psychical and the physical, of 'thinking substance' and 'extended substance.' For Platonism the function of the psychical is essentially cognitive under the two aspects of sensation and thought. The mind receives impressions from the things of sense, and it thinks. If we review in the light of this dialectic Kant's conception of an impression of the noumena upon the psyche in the form of phenomena (passive) and the operation of the understanding with reference to these (active), and Locke's conception of foreign things making an impression upon the *tabula rasa* in the form of simple ideas of sensation, and the

[9] *Op. cit.*, ii, 526.

[10] See above pp. 55 ff.

'actings of the mind' with reference to these,—when we review these conceptions of mind that are held respectively by these formulators of idealism and sensationalism, we note that, in so far as they involve a psychological system, this system reveals essentially the dialectic of Plato's psychology.

In James and Dewey we have a forsaking of this point of view and a more or less definite harking back to a position not prominent in the earlier development of modern philosophy. The psychological dialectic shifts from the Platonic to the Aristotelian,—a point that is not always clearly recognized in much of the mutual criticism of structuralist and functionalist, of 'objective' psychologist and behaviorist.

Let us review briefly the chief points in Aristotle's conception of mind. We recall that for Aristotle mind is the 'form-giving' principle in nature. It is the 'entelechy,' the organizing aspect of the vital process. The fundamental factors are 'functions' that involve other organized functions as their basis. These become the 'structures' for the organizing function. The activities of the entelechy are of three kinds: vegetative, appetitive, rational. In other words, the purely physiological functions of nutrition, the metabolisms, the glandular activities, the organization of instinctive responses, the conscious voluntary activities, are all conceived as inter-dependent functions of this entelechy. Functions, not structures, would appear to Aristotle primary: *τὰ δ'ὄργανα πρὸς τὸ ἔργον ἡ φύσις ποιεῖ, ἀλλ' οὐ τὸ ἔργον πρὸς τὰ ὄργανα.* The psychical, forming, organizing aspect as it involves appetitive and emotional, and therefore, presumably, conscious factors, is more clearly brought out by this other quotation: *διὰ τὸ θύμον ἐχεῖν ὅπλον ἐχει*, that is, since the insect is wrathful it has organs of attack.[11] The child desires the bright object placed before it; out of the mass of movements that he makes, an adequate grasping habit is finally built up. This habit imbedded within the nervous system would represent the 'structure' that has developed as a result of the 'desire' as a psychical function. . . . Such a point of view finds in its study of mind (1) certain already established reactive tendencies, caught up in (2)

[11] *De Partibus Animalium*, iv.

a re-organizing integrative process which goes on under the influence of (3) a 'biological end' or 'purpose.' One marvels at the fidelity with which this dialectic of the Aristotelian conception is adhered to, either explicitly or implicitly, not only in much of the later psychological literature, but also in physiological and biological discussions, as well.

The shift from the Platonic to the Aristotelian conception of the psychical is most satisfactorily brought out in connection with the problem of sensory consciousness. It involves a threefold change in the conception of the nature of sensation or in its status. (1) Sensation may come to be regarded as partaking not only of the nature of a psychical existence, but also of the nature of an organic activity in which it is functionally related to the organism's reaction to stimuli. We are told that sensation instigates movement and that "a completed experience is not merely sensory it must be motor as well."[12] It is conceived as organically related to the reflex-arc. "Left to itself," writes Angell,[13] "any conscious state converts itself into muscular motion." "The action theory," writes Münsterberg,[14] "claimed that the inner experience depended not only upon the incoming but also upon the outgoing current: the central excitement is every moment related not only to the sense impression but also to the openness or closedness of the path of motor discharge." In the case of a child that reaches after a bright object, say a candle flame, there is the sensory experience of light, plus the tendency to reach after it and the sensation of pain plus the tendency to shrink or withdraw. (2) The activities in which these sensations are integrated into perceptual and ideational complexes are regarded not only as mental integrations of various degrees of complexity, but also as integrations and reorganizations of the several reflex arcs to which the sensations are organically related. "Every new shade of meaning from new associated elements must vary the impulse to reaction," writes Münster-

[12] Colvin, S. S., *The Learning Process,* 1912, 15.
[13] Angell, J. R., *Psychology,* 1908, 363.
[14] Münsterberg, H., *Psychology, General and Applied,* 1914, 155.

berg;[15] and again: "we can only say that any group of sense impressions is held together as a perception, if it is connected with one responsive attitude of ours."[16] In the case of the child and the candle the reflex tendencies may become ultimately reorganized in the sense that the child will tend to shrink from the light instead of reaching after it. Such a reorganization would involve a mental integration of light and pain sensations in the sense of Wundt's fusion or assimilation, and physiologically an integration resulting in the formation of a response very like the 'conditioned reflexes' of Pawlow. The reorganization of 'sensations' in mental activity is thus interpreted not only as a reorganization of sensations within the pattern of consciousness, but also as a reorganization of the reactive tendencies that are, hypothetically at least, related to the 'sensations' involved. (3) And the third factor in the Aristotelian conception emphasizes the fact that the sensations that are precipitated into this organizing activity do not arise fortuitously, or as a result merely of the action of physical stimuli upon the sense-organ, but are determined also by certain 'selective' functions of the organism itself. This organic determinant is variously conceived, depending upon our interest: psychologically it is conceived as the '*Aufgabe,*' or task, physiologically as the 'biological purpose,' and behavioristically as a 'hunger' or a 'state or appetition or aversion.'

Let us here make adequate apologies to Plato and Aristotle for thus using their names to distinguish between these respective views. Such a procedure is justified only because it succeeds in giving logical continuity and historic perspective to a very complex problem. Our problem is this: how do these two conceptions of mind stand related to the 'law' of dynamogenesis regarded as a psychological doctrine?

The first of these points of view emphasizes stimulus, sensation, and sensory integration in perceptual and ideational complexes,—these integrations being the correlate of neural integrations arising by reason of diffusion, not to muscle but rather

[15] Münsterberg, H., *op. cit.*, 161.
[16] Münsterberg, H., *op. cit.*, 146.

throughout certain central portions of the nervous system. It has little to say about motor response and the relation of consciousness to it, so that, left to itself, it would hardly espouse the doctrine of dynamogenesis. .It is therefore not surprising that we find, as a rule, the antagonists of the doctrine, in its psychological form, amongst the Platonizers. As a matter of fact, the doctrine can gain a foothold amongst them only when the relation of consciousness to stimulus is emphasized. There where the sensationalistic doctrine that all consciousness has its rise in sensory stimulation is fundamental to psychological thinking, there the physiological doctrine that all stimulation of the organism leads to movement may take on a special significance; for if the latter is accepted as a general principle, it follows from the two premises that all cases of consciousness are in some way cases of movement. In general, however, the Platonic view of mind is inimical to the doctrine as a psychological principle. It is significant that it is the major premise, *viz.*, the original physiological doctrine of dynamogenesis, that is attacked by two of the chief opponents of the psychological doctrine. These are Titchener[17] and Stumpf.[18] The psychological points of view of these writers have this fact in common: they both reveal the influence of what we have called the Platonic conception of mind; the one, however, showing primarily a sensationalistic, the other an intellectualistic, bias. . . . The doctrine of dynamogenesis as a psychological principle is not an integral part of either of these developments of the Platonic conception of mind.

It is quite otherwise in the case of Aristotelianism in psychology. This tends to emphasize the point that the unity of the 'object' in perception and thought exists by reason of neural discharge to a coördinated motor system, and that the diversity within this unity exists by reason of tendencies to diffuse to other motor systems. The diverse factors are diverse because these incipient tendencies represent the beginnings of new integrations into different sensori-motor coördinations. This point of view regards consciousness as so completely involved in a

[17] Titchener, E. B., *A Text-Book of Psychology,* 1910, 488-489.
[18] Stumpf, C., *Zsch. f. Psychol.,* 1899, xxi, 78.

functional relationship to movement, that such generalizations as "consciousness is in its very nature impulsive" appear quite natural to it, and no critique of the doctrine has ever come, so far as we know, from a functionalist's pen.

III. Methodological Implication: Behaviorism

Once the physiological generalization that excitation of receptors diffuses always to effectors has received the psychological interpretation just outlined, we discover that it involves a very definite methodological implication. If it were true that all mental integrations in perception, ideation, etc.,—whether the nervous correlates assigned them be diffusion from sensory projection-areas to other sensory systems or to motor systems,—find complete registration in modifications of activity in muscle or gland, then the method of 'objective' psychology and of behaviorism could claim to be adequate and sufficient for its task; for the method of behaviorism follows logically from the doctrine of dynamogenesis in both its physiological and psychological formulation. It becomes quite needless to refer to consciousness at all, for we obtain our registrations quite independently of such reference.

Thus the psychology that hoped to get on in a comfortable manner, by entertaining, in the goodness of its heart, all sorts of tentative hypotheses, has been, temporarily at least, dispossessed of part of its hereditary estate. It will profit little merely to assert that there are 'mental facts,'—for behaviorism will answer "perhaps yes, perhaps no, but by hypothesis all 'mental' processes 'produce' movement of muscle, or change in glandular secretion; we therefore are taking into account all that need be. The mythical mental processes that do not register thus do not concern us."[19] Or with pragmatism it might say that that which makes no difference in the act (of muscle or gland), makes no difference in fact, and thus it would bring full-circle the development that began when James took over the principle of diffusion of Bain and that of dynamogeny of Féré and wove

[19] Cf. Watson, J. B.: "All organization, no matter what its character, shows directly for what it is worth in the appropriate muscles." *Behavior*, 1914, 324.

them into the fabric of his own fruitful thinking, concerning which no one can affirm that it was not an admirable case in point of the principle involved. And what behaviorist would undertake to catalogue the modifications of behavior, not only of American psychologists, but also of the people at large, that may be referable to the stimulation arising out of James's expressions?

But James, we saw, had been much influenced by Féré, and it is therefore of no small interest to turn to the latter's little classic and there find written, as far back as 1887, the *credo* that leads ultimately to the rejection of the psychical altogether by the behaviorist today. It is so clearly formulated that we cannot do otherwise than give it here in the original: "Or si on peut prouver expérimentalement que la pensée n'est autre chose qu'un mouvement de la matière, qu'il ne se passe rien dans l'esprit qui ne se traduise à l'exterieur par des mouvements, secretions, etc., par une modification générale des fonctions organiques, il s'ensuit qu'il est seulement nécessaire de savoir lire les signes exterieurs pour connaitre ce qui se passe dans l'esprit."[20]

IV. Criticism of the Principle: Physiological

The outcome of this development of the principle of dynamogenesis, then, has been that the facts of the psychical life have no *point d'appui,* in terms of the principle, with reference to the functional system of neural arcs that connect the receptive organs of the body with its effectors. Indeed, the attempt to do so has succeeded quite effectually in leading, in some quarters, to the denial of the psychical.

Our criticism of the doctrine of dynamogenesis will involve, first an examination of the physiological principle that all stimulation of sense-organs necessarily 'expresses' itself in movement or in glandular secretion. And secondly, it will lead us to inquire into the status of the principle in its psychological form.

Since James gave the original impetus for its spread in this country, let us return to one of his formulations. *"Using sweeping terms and ignoring exceptions,* we might say that every possible feeling produces a movement, and that the movement is a

[20] Féré, C., *Sensation et mouvement,* 1887, 116.

movement of the entire organism, and of each and all its parts."[21] The italics are ours. In the original the relation of the italicized and the unitalicized portions are just reversed. We are, for the present, of course, interested in what may be, for James, exceptions. We can discover only two such in James, and in the case of one of these it is doubtful whether it is, to his mind, truly an exception. We are told that sometimes consciousness does not produce action on account of the 'inertia' of the effector apparatus, but that, nevertheless, this restrictive inertia "obviously introduces no essential alteration in the law," for "there is an inertia in the motor processes as in all other natural things."[22] And "there are probably no exceptions to the diffusion of every impression through the nerve centres. The effect of the wave through the centers may, however, often be to interfere with processes and to diminish tensions already existing there; and the outward consequences of such inhibitions may be the arrest of discharges from the inhibited regions as the checking of the bodily activities already in process of occurring." "In general, however, the stimulating effects of the sense-impression preponderate over the inhibiting effects, so that we may roughly say, as we began by saying, that the wave of discharge produces an activity in all parts of the body."[23]

These two facts, that of 'inertia' of peripheral motor mechanism and that of inhibition, are recognized by James as possible exceptions. Let us consider them in their physiological implications.

In speaking of the 'inertia' of the motor processes James presumably means the factor of physical inertia in the muscle. But paralleling this muscular inertia is the inertia that is characteristic of the receptor mechanism, which is equally important. For if we entertain the conception of inertia at all, inertia both of receptor and of effector must be conceived as determinants of the 'latent time' of the arc. In addition to this inertia of the arc-terminals, we have a similar factor in connection with the

[21] James, W., *op. cit.*, ii, 372.
[22] James, W., *op. cit.*, ii. 526.
[23] James, W., *op. cit.*, ii, 374.

nerve-trunk. For it, too, has a latent-time.[24] And as a third factor, if we follow Sherrington, we have the 'resistance' of the cell-wall at the synapse. But these same three factors that thus enter in as part-determinants of the latent-time of the reflex arc must, on any hypothesis whatsoever, be conceived also as part-determinants of the stimulus threshold. Other things being equal, this threshold will vary as the 'resistance' offered by these elements in the arc. If now we take into account the fact of summation-effect of subliminal stimulation, the inference may be made with reasonable safety that the function of the successive subliminal stimuli has been, in part, to overcome the resistance offered by all these elements taken both as a whole and as parts of the arc,—no matter how this 'overcoming of resistance' may be conceived.

Thus, in part, the consequent of sensory stimulus consists in such *priming* of the elements of the arc,—and unless the threshold is reached, either through increase in strength of the stimulus, or through further summation of the subliminal stimuli,—we shall have the case of stimulation affecting the physiological mechanism without producing either muscular contraction or glandular secretion. . . . This is, of course, simply another statement of the argument of stimulus-threshold against the principle of dynamogenesis in its physiological form. But this slight variation in form makes possible the conception of the structural and functional unity of the arc,[25] without postulating that necessarily the only mode of functioning of such an arc or system of allied arcs is the production of actual contraction of muscle or of glandular secretion. The facts of summation-effect of subliminal stimuli, of latent-time of nerve-trunk conduction, of latent-time of reflex conduction,—all these taken together indicate that they are essentially facts that are referable to a very specific process going on in the organism, *viz.*, the *priming* of the specific neural path, including receptor and effector.

This conception may well be kept apart from that of *Bahnung*, for the reason that it does not refer, primarily, to the synaptic

[24] Sherrington, C. S., *op. cit.*, 18 ff.

[25] Cf. Watson, J. B., *Behavior*, 1914, 20.

function within our original arc,—for lowering the threshold at the point of neural connection is but one of the factors in this *priming* of the path. The other factors are the lowering of the resistance that is offered by receptor, effector, and conductor. The resistance of the wall in the efferent portion of the original path may or may not be lowered by the facilitating effect of other, allied, reflex functions concomitantly occurring, or raised by the inhibitory effect of still other, antagonistic, reflexes. These effects of other reflex activities may thus enter in as part-factors, furthering or hindering the priming of the original reflex path,—but only as part-factors, for we noted that that priming involves more; namely, the overcoming of the resistance of receptor, conductors, and effector.

The arc is thus seen to possess an individuality of its own quite apart from its relationship to other arcs. The effect of subliminal stimulation—though no overt response occur—is therefore necessarily to be considered an actual one. It prepares a *specific* path, it organizes it. Energy may be, ultimately, released in the effector, but before this can occur there must be organization of the arc. The process of organization is not 'expressed' elsewhere but in the condition of the arc itself.

Furthermore, the facts revealed by that long patient inquiry that began when Ebbinghaus first set himself to learning nonsense-syllables, leads to the inference that all repetition of acts effects something more than the release of energy in the effector, —it has a further effect upon the condition of the path itself; it may contribute to its further *priming*. It is this effect of stimulus that the psychology of learning states in terms of the effect of number and distribution of repetitions, of the 'filled' and the 'unfilled' post-assimilative period, etc.

Now certain other psychological facts that we shall mention later appear to demand the distinction between the condition of the neural arc itself and the effect that its relation to other arcs may have upon it. These other arcs may heighten or lower its responsiveness by reason of their inter-relationship at the synapse, as the facts of facilitation and inhibition indicate. But the determinants of the condition of the arc are not all enumerated

when we note this facilitating or inhibiting effect of other arcs upon it, for the excitation of the arc in its own, more immediate, function, involves work done that consists in the organization or patterning of all its structural elements, including receptor, conductors, synapses and effectors. This process we call *priming*.

Exner[26] used the term *Bahnung* to cover the entire range of neural facilitation, including not only this organization of a given arc, but also,—and that was the important thing for him,—the general fact of its facilitation through allied arcs. Furthermore, he thought more particularly of the synaptic resistance and not of the other factors dwelt upon above. Had it not been for this, the word *Bahnung* would have been a much more satisfactory term for the specific conception developed here. For Exner was, even at that early date (1882), speaking of an effect of sensory stimulation that was essentially an effect in the nervous system itself.

The organization of the arc is therefore to be conceived as a consequent of sensory stimulus just as much as is the release of energy in effectors. If the decrease in time for subsequent responses, the lowering of the stimulus threshold after previous stimulation both subliminal and adequate, the shortened time for re-learning, as well as the other facts of memory,—if these taken together indicate anything it is this: that all stimulation of the neural arc has a very real effect upon that arc, modifying it in the sense of preparing it. Furthermore, this activity, process, function, may at times go on without being accompanied, or followed by, an actual release of energy in the effector. This priming or organizing of the arc is a fundamental biological activity, involving, like all physical activities, the factors of time and of energy-transformation, just as the organization of an electric field involves a rearrangement of the molecules along the lines of force, and this organization of the machine is a process that is factually distinct from the function that the machine may subsequently perform as a source of energy.

But leaving aside the problem of the transformation of the

[26] Exner, S., (Pflüger's) *Arch. f. d. ges. Physiol.*, 1882, xxviii. 487-560.

energy involved in this process of organization (cf. Lehmann)[27] we have so much as the positive outcome of our inquiry: there is a mode of stimulation of the organism that does not 'express' itself in the release of energy in the effector but in the priming of paths. This mode of stimulation is of primary importance in the life of the organism and the 'response' to it is a constant reorganization of the elements in the neural arc and in the relationship of the arcs to one another. The organism is constantly exposed to such stimulation and a large part of its 'experience' is essentially of this sort—by no means involving necessarily motor response or contraction of muscles or secretion in glands, to say nothing of consciousness at this point.

The second point at which James's conception of the principle of motor discharge gave rise to possible misgivings was in connection with the facts of inhibition. Sometimes, he says, diffusion effects inhibitions, resulting in the checking of bodily activities in process of occurring. But generally the stimulating effects of a sense impression preponderate over the inhibiting effects. . . . It is not quite clear how James would have us regard the facts of inhibition. Are they exceptions to the general rule and therefore to be placed over against the usual effects of stimulation? Or are they a sub-class under the latter heading?. . . But James wrote twenty-five years ago and it is only since then that much of the work, putting the facts of inhibition before us in a clearer light, has been done. At times he takes note of it as a central phenomenon and at other times he seems to interpret it as being essentially a muscular affair involving the opposition of antagonistic muscles. And if this was his conception, it is essentially borne out by the facts that have been gathered by the physiological study of the reflex mechanisms. That the inhibition, however, may be as much the effect of sensory stimulation as is motor excitation, may not have come home to him so definitely as it might today.

Sherrington writes: "The striking correspondence observed between the reflex inhibition and the reflex contraction, when examined in one and the same type-reflex, allows the inference

[27] Lehmann, A., *Grundzüge der Psychophysiologie*, 1912, 141 f., 534 f.

that the nerve-fibres from the receptive field of the reflex each divide in the spinal cord into end-branches (e.g. collaterals), one set of which, when the nerve fibre is active, produces excitation, while another set, when the nerve-fibre is active, produces inhibition. The single afferent nerve-fibre would therefore in regard to one set of its terminal branches be *specifically excitor,* and in regard to another set of its central endings be *specifically inhibitory*. . . . In denoting one set of central terminations of an afferent arc '*specifically inhibitory*', it is here meant that by no mere change in intensity or mode of stimulation can they be brought to yield any other effect than inhibition."[28] Inhibition, therefore, "is not a *neutral* process, for at least in many cases it leaves the reflex centre surcharged for subsequent response,"[29] as in the case of 'successive induction'. "It rather seems to predispose the tissue to a greater functional activity thereafter." And while "we do not yet understand the intimate nature of inhibition", its seat is in many cases "certainly central, and in all probability is . . . situated at points of synapses."[30] Inhibition, Sherrington is at pains to indicate, is not a 'neutral' process; and again, it is often a 'central' process.

It is significant that Sherrington should raise the question of 'neutrality' at all. It is not merely the case of an arc that does not respond or that ceases to respond to stimulation with an excitation of effector. The particular arc may function positively in bringing about cessation of muscular contraction; or if the muscle be relaxed to begin with, the presence of the inhibitory stimulation modifies the behavior of the effector when the stimulus, that otherwise is followed by a contraction of the muscle, is presently applied. The effector then does not respond with movement, so long as the inhibiting reflex activity lasts.

Furthermore, it is probably "a central and not a muscular affair." The distinction between peripheral and central mechanisms of inhibition is, of course, of especial interest to us. If antagonistic muscles are contracted, we have, to be sure, an inhi-

[28] Sherrington, C. S., *op. cit.,* 105.
[29] Sherrington, C. S., *op. cit.,* 194.
[30] Sherrington, C. S., *op. cit.,* 192.

bition of an overt act,—but there is nevertheless release of energy in the muscle. But if we have the muscle in a relaxed condition by reason of the functioning of a stimulus,—then we have no muscular movement or change. Such an effect of stimulus, then, is for Sherrington not a muscular affair. Its seat is "central, and in all probability is . . . situated at points of synapses." We have here another effect in which stimulation brings about not muscular contraction, but the relaxation of muscle or a prevention of contraction, and so long as this condition in the neural arc lasts, stimuli, otherwise movement-inducing, cease to bring about their appropriate outward 'expressions'.

The evidence, then, is for an effect of stimulation that is not expressed primarily in terms of movement and glandular secretion, but is to be stated in terms of changes in the organization and set of the neural arcs within the nervous system itself. This effect consists, in part, in raising or lowering the functional threshold of arcs, either in the priming of the arc as a functional unit, or in its inhibition or facilitation by other arcs to which it is related.

It is in these types of neural activity that we must seek for the physiological correlates, not only of the effects of practice that have been systematically determined by experimental psychology and stated as the conditions or laws of learning, but also of the various determinants of conscious patterns, that psychology has come to refer to as determining tendencies, both innate and acquired. Subliminal stimulation, as well as overt practice, *primes* the arcs involved in 'association'; central inhibitions, and central facilitations as well, constitute the physiological basis for a continual shifting and development of 'impulses' and 'motives' that sometimes have a conscious correlate in felt needs, desires, and wishes, and also in the modifications of the pattern of thinking. The study of this pattern reveals the fact that the 'laws' of association, which under controlled conditions of learning show a regularity that parallels that which is found in other biological facts,—that these 'laws' are sometimes cut clear across by a change in the 'determining tendency'. Witness Ach's study on this point. Quite apart from the question of the felicitousness

of his controlling conception in the formulation of his problem, *viz.*, that of the 'will',—conceived, it almost seems at times, in terms of the much disdained faculty psychology,—his work and method constitute a brilliant contribution to our common aim: the knowledge of the nature and mechanisms of the psychical life. Now these mechanisms, in so far as they have been studied, reveal a mode of operation that parallels those that have been under discussion in this paper. We assume therefore, provisionally, that the correlate of much of that which is revealed in consciousness as modifications of mental events, in memory, volition and thought, is all of a piece on the physiological side with the mechanisms of the priming and mutual facilitation and inhibition of the neural arcs.

And much of this is a function of sensory stimulation that, quite contrary to the more general interpretation of the principle of dynamogenesis in its physiological form, finds no immediate 'expression' in muscular movement or glandular secretion. It is largely a 'response' in terms of central neural activities. In the light of the facts the physiological formulation of the principle of dynamogenesis becomes invalid. It is to be replaced by the principle that all stimulation effects a change in the set of the nervous system; and a distinction is to be made between change in neural set, on the one hand, and muscular excitation and inhibition on the other.

V. Criticism of the Principle: Psychological

The major premise from which is derived the psychological formulation of the principle of dynamogenesis thus becomes invalid. This major premise was the physiological hypothesis that all peripheral stimulation of the organism finds expression in a reflex response in muscle or gland. It is beyond our purpose to trace this hypothesis in the French psychologists of the eighteenth century, in the early physiological interest in the reflex mechanisms during the early sixties, and in the latter-day fixing of the hypothesis as a guiding conception in the anatomical localizations of the neural paths that constitute the mechanisms of the sensori-motor activities. When psychologists took over this

hypothesis from physiology, they found it not at all incompatible with the older psychological doctrine that all consciousness derives from, or arises concomitantly with, or is the result of, the stimulation of sense organs,[31]—a conception that represents psychology's heritage from Lockeian sensationalism. With the physiological principle that all sensory excitation leads to movement, as the major premise, and the Lockeian principle that all consciousness derives from sense-organ excitation, as the minor premise, we have the rise of the statement that all consciousness involves a motor response. And this is the only form of the psychological statement that ever could be legitimately derived from the physiological formulation; but in so far as it rests upon this latter, it, too, must be abandoned.

We saw, however, that certain psychologists held another view of mind that leads directly to the enunciation of the principle of dynamogenesis as a psychological formula. In this view consciousness is related not merely to stimulus but to the neural arc as a whole. The typical activity of this neural arc is conceived as being essentially the bringing about of motor response to sensory stimulation. Hence consciousness, too, is conceived as being "in its very nature impulsive". "Left to itself," we are told, "every conscious state converts itself into muscular motion". It is—may we repeat?—with the Aristotelian in psychology that dynamogenesis has had its greatest vogue. As with James, by whom exceptions to the principle were minimized, so through the whole later development of psychology. Yet in spite of this emphasis upon motor discharge, certain factual observations that may prove ultimately to have a very real bearing upon the status of consciousness, have filtered through. The observation in question is that consciousness is a phenomenon that is to be noted not so much in connection with actual movement as in connection with the absence or surcease of movement. A study of the literature discloses the fact that notwithstanding the dominance of dynamogenesis as a psychological principle, we find repeated reference to the occurrence of consciousness as arising particularly in connection with impeded activity.

[31] Cf. below, p. 105.

Curiously enough, the incompatibility of these observations with the assumption of the guiding principle is not always clearly recognized. Yet, rightly understood, this observation that consciousness is a phenomenon occurring not in connection with movement, but at the point of inhibition of overt behavior, becomes of utmost importance for a statement of the psychical.

It is unfortunate that a clear-cut distinction is not always made between the factual statement of motor inhibition as a condition for the rise of consciousness and the theory of neural function. Absence of movement—at any rate—is frequently interpreted at once as a 'closedness' of neural paths. And the fact that consciousness is noted to arise when there is cessation or absence of movement is often treated as if it necessarily committed us to the theory that it is the immediate correlate of activity at the point of the 'closed' or 'difficult' synapse. It is needful, therefore, to distinguish between the statement of the factual relationship of consciousness to the phenomena of inhibition and the theory of the relationship of consciousness to neural function. It is the former, and not the latter, relationship that interests us here.

Binet remarks to the point that with slight exaggeration one might say that "toute la vie psychique . . . depend de cette suspension de l'activité motrice; les actes réels sont remplacés par des actes virtuels, des attitudes."[32]

Angell writes as follows: "It may be asserted that consciousness in one or the other of its forms normally appears and participates only in such activities as can not be efficiently executed by the hereditary reflexes and acquired automatisms." . . . "Obviously in the case of the infant there can be at the outset no acquired habits and it seems reasonable therefore to assume that conscious activities emerge at the point where reflex acts are found inadequate to meet the needs of particular situations." "If the reflexes and the automatic acts were wholly competent to steer the organism throughout its course, there is no reason to suppose that consciousness would ever put in its appearance. Certainly we never find it obtruding itself where these conditions are observed, except in pathological instances." In his chapter

[32] Binet, A., *L'année psychol.*, 1911, xvii, 24.

on *impulse* he says that it is true that "left to itself, any mental condition would convert itself at once into some kind of muscular movement," but "this fact must not, however, be interpreted as meaning that all states of mind reveal these motor consequences in equal measure. It requires no elaborate demonstration to know that we are most distinctly cognizant of the impulsive nature of this reaction when for any reason its expression is *hampered* or *checked*. But the impulse to act, as such, we are hardly aware of in any genuine sense, unless something impedes the impulsive movement."[33]

To these citations from Binet and Angell we might add many more from Marbe, Mayer, and Orth, who find specific modes of consciousness peculiar to frustrated, hampered, checked, or inhibited activities in connection with their study of the thought processes. And Mead,[34] in a suggestive paper, which, unfortunately, does not develop a method, even makes the process of inhibition *the* subject-matter of the science of psychology. "The statement of the conflict of an impulse with a coördination of impulses and the inhibition of these impulses will be a scientific treatment of the psychical."

While these writers may serve to indicate that the psychologist at times finds his problem at the point where consciousness arises in connection with some sort of inhibition, it must be said that he has yet to formulate it more definitely with reference to the different types of inhibition. It therefore becomes one of his tasks to discover just what types of inhibition represent conditions for the rise of consciousness, and to seek to correlate different types of consciousness with these different types of inhibition.

Not all inhibitions, Sherrington points out, are muscular affairs, in the sense that antagonistic muscles are contracted,—some are 'central' affairs. Some of these central inhibitory functions he places more specifically in the motor centers, others in the afferent neural mechanisms. Added to these is the possibility

[33] Angell, J. R., *op. cit.*, 363-364.

[34] Mead, G. H., The Defir.ition of the Psychical, *The Dec. Pub. of the Univ. of Chicago,* 1903, iii.

of another type of 'peripheral' inhibition, that is not touched upon by Sherrington. It arises not by reason of the mutual inhibition of simultaneously contracted antagonistic muscles, but by reason of the *peripheral* relation of sensory and motor mechanisms as when the reflex attentional adjustment of a sense organ to a certain stimulus raises the threshold for all other stimuli and lowers it for the specific response to the given stimulus. This type of inhibition was noted already by Cabanis[35] who thus anticipates Dewey's conception of the 'organic circuit' in which the present response determines sensation as it shall be a moment hence.

Some of these types of inhibition are peripheral affairs and may be *directly* observed as a definite kind of motor response resulting from contraction of antagonistic muscles, and these would thus constitute the content of a 'behavior' that may be correlated with certain forms of stimulation, as was done by Sherrington. Others, however, are not peripheral but central; inferentially they are functions of the activity of the nervous system, factually they are given as modifications of consciousness. They are not directly 'expressed' in muscular response at all. It is significant that Watson in his book on *Behavior* refers only in passing to the phenomenon of inhibition, and lists it not at all in his index. . . . Now if it be true that conscious proecsses occur particularly in connection with these inhibitions, then a complete account of the life-process of the organism will require not only a statement of the behavior that may occur in response to stimulation, but also a statement of these conscious processes that occur when the stimulus produces no motor reaction, but rather an inhibition of movement.

In allowing one of its most significant observations, *viz.*, that consciousness is a phenomenon in some way related to inhibition, to be obscured by this unfortunate emphasis upon the 'law' of dynamogenesis as a universal principle, psychology has neglected one of its chiefest opportunities for arriving at a fruitful functional statement of consciousness.

[35] *Oeuvres complètes*, 1824, iii, 152 f.

VI. Conclusion and Summary

The principle of dynamogenesis has, psychologically, no intrinsic relationship to that Platonic conception of mind which emphasizes stimulus and sensation and the patterning of consciousness in various types of mental activity. For such a view the principle is an importation from physiology. . . . It is, on the other hand, enthusiastically espoused by those who hold what we have called the Aristotelian point of view in psychology.

In its physiological form, the principle of dynamogenesis maintains that neural discharge into muscle and gland is the primary and universal effect of stimulation. But our study has convinced us that these effects are neither universal nor primary. The immediate and direct effects upon the central nervous system are quite as important as the motor consequences. These central effects are, as we have shown, of three general kinds: *viz.,* (1) the *priming* of the individual arcs, (2) the initiation of reflex *inhibitions,* and (3) the *organization* of neural systems throughout the brain by means of mutual inhibitions and facilitations.

On the side of mind, we do not mean to deny that the fact of motor discharge is of great importance for those central processes which form the immediate conditions of consciousness. We do, however, mean to affirm (1) that consciousness does not reveal itself as "motor," but that, on the contrary, it arises in conjunction with the inhibition of movement; and (2) that its dependence upon neural organization,—which involves priming, simple inhibition, and the functional integrity of the whole central organ,—is quite as essential and as significant for psychophysical doctrine as its dependence either upon stimulus or upon motor response.

Although we reject, therefore, the principle of dynamogenesis, we must admit that its exponents have, in their insistence upon central inhibition as the essential condition for consciousness, unintentionally suggested a satisfactory substitute for their original doctrine; and rightly understood, this observation that consciousness is a phenomenon occurring, not in connection with movement, but at the point of inhibition of overt behavior, becomes of the utmost importance for a statement of the psychical.

THE PSYCHOLOGICAL ANTECEDENTS OF PHRENOLOGY

By Madison Bentley

I. The foundation of Gall's system.
II. The influence of the French sensationalists.
III. The influence of faculties and of German empirical psychology.
IV. Gall's doctrine and modern psychology.

Dr. Franz Joseph Gall, a contemporary of the poet Goethe, was the founder of phrenology.[1] He is to be numbered among those brilliant and agressive souls who create with like facility enemies and friends, who attract the reverent admiration of disciples as they attract the fires of denunciation, and who establish schools and creeds under the frown of emperors and flourish under the ban of episcopal authority.

Such men are difficult to measure. The emotional standards of their times either dwarf or exaggerate them. Only history can set them in just perspective; because history alone discovers their antecedents, traces their divergent course from the broad paths of tradition, and marks the impression which they leave upon men and upon knowledge. In the case of Gall we now know with some exactness how the man stood related to his own time, and we also know, in part, the influence which his doctrine has since exerted upon psychology, nervous anatomy, and the differential study of character. But the intellectual antecedents of his famous doctrine still remain in the obscure archives of science and philosophy. The elucidation of them is the task of the present essay.

I. The Foundation of Gall's System

To understand Gall, then, it is as necessary to go behind the contempt of those who place all phrenologists with the students

[1] Gall was born in Tiefenbrunn in 1758: he died in 1828. P. J. Möbius (in "Franz Joseph Gall"; *Ausgewählte Werke,* vol. vii, 1905) gives biographical sources and a short sketch of his life and writings.

of alchemy, palmistry, and astrology as it is to set aside the educational and moral constructions which have been shabbily built upon his doctrines of cerebral physiology.

The practitioners of phrenology have long been accustomed to invoke Gall's doctrine as a scientific sanction for their half-magical art of characterology; but their own popular expositions have, naturally enough, laid undue emphasis upon cranial peculiarities and the alleged significance of these in divining moral qualities and individual traits. These exaggerations and distortions of Gall we must ignore as we hope to do justice to the founder.

Gall was himself led in youth—so much we must acknowledge—to believe that certain facial and cranial features were symptomatic of mental traits.[2] Moreover, he seems always to have been interested in the determination of character and of mental capacity. Nevertheless, these practical issues may reasonably be regarded as secondary to his scientific doctrine. And in our historical quest the main enquiry will be directed toward the principle of psychophysical dependence which underlay the founder's whole system,—a principle which has steadily grown in importance with the empirical development of psychology and of the biological sciences.[3]

As applied by Gall, this principle alleged the existence of a

[2] Gall, F. J., *Anatomie et physiologie du système nerveux en général, et du cerveau en particulier, avec des observations sur la possibilité de reconnoître plusieurs dispositions intellectuelles et morales de l'homme et des animaux, par la configuration de leurs têtes,* vol. i, 1810 (Paris), p. ii (preface). The entire work includes four volumes of text and a volume of plates, and appeared during 1810-1819. The first two volumes (1810, 1812) Gall wrote in collaboration with his pupil and disciple, G. Spurzheim. This compendious publication lays the foundations of phrenology. The later work of Gall, *Sur les fonctions du cerveau, etc.,* 6 vols., Paris, 1825, is not a mere reproduction; it omits the descriptive anatomy and the plates and it includes much new critical material.

[3] Broca, Gratiolet, Déjerine, Pierre Marie, Möbius and other neurologists have commended Gall's use of this principle. Cf. Blondel, Ch., *La psychophysiologie de Gall; ses idées directrices,* Paris, 1914, 3-8. "La psychophysiologie générale de Gall," agrees Blondel, "se détache donc naturellement du reste du système, et nous nous croyons, par conséquent, en droit de limiter à cet objet notre étude" (15).

number of separate and distinct cerebral organs, which stood in functional relation to the several capacities and traits of the human and the animal mind. These organs, which exceeded twenty-five in number, were innate and heritable, although their development rested, in part, upon the exercise of function during the life-time of the individual.

Gall's method of investigation was empirical. He was a shrewd observer, and he seems to have been cautious in generalization.[4] He examined the heads of men of talent and of genius, and the heads of the criminal, imbecile, and insane, making measurements or taking casts, and, if fortune favored him, adding the skulls to his large collection; he compared successive generations for common traits; he noted the mental and physical peculiarities of various animals, and he observed and dissected a great number of brains.[5] He insisted—against many authorities and classical examples and on grounds of comparative physiology—that the neural pathways must be traced from below upward and not by slicing down from the vertex to the lower centres. By multiplying observations and experiment he sought to divide off the accidental from the essential and then, by generalization, to establish principles and laws.

So much by way of reference to the problem and the method of Gall is necessary if we are to view his work in the light of antecedent systems and doctrines. To his predecessors we now turn.

No one familiar with the history of psychology would seriously contend that the fact of the bodily dependence of mental phenomena awaited the discovery of an anatomist at the beginning of the ninteenth century. We readily trace psychophysical

[4] Möbius (p. 5) quotes a contemporary, W——r, who wrote in 1802: "Auffallend ist es, wie langsam Gall in seinen Ueberzeugungen seinen eigentlichen Beobachtungen nachschreitet. Viele Behauptungen stellt er noch als Frage auf, zu deren Bejahung ihn doch eine beträchtliche Menge von Thatsachen berechtigen. Er is unermüdet in Befragung der Natur."

[5] In 1802 he was said (Möbius, p. 6) to possess over three hundred skulls of persons whose mental characteristics he knew, and one hundred and twenty casts of distinguished living persons. In subsequent years these collections were largely increased. Cf. Gall, *Anatomie*, etc., 1810, i, 27.

doctrines to the Greek physicians and philosophers, and we halt there, in all probability, only because we lose the thread of tradition. Were the historical gaps filled in, we should doubtless follow the uninterrupted lineage of these doctrines straight back to those early times in which men failed clearly to formulate a distinct difference between mental and physical existences. If our historical enquiry is to be significant, it must leave the paths of general psychophysical history and discover the appropriate antecedents of the special and peculiar form of the principle of dependence which was adopted by the founder of phrenology.[6] These appropriate antecedents we look for first among the French sensationalists of the eighteenth century,[7] and secondly among rationalistic and empirical systems current in Germany during the same period.

II. The Influence of the French Sensationalists

The sensationalistic doctrine of the French school, with which Gall was familiar,[8] was in the main an acceptance or a modifica-

[6] Gall himself bases his doctrine upon the following presuppositions: "(1) que les qualités morales et les facultés intellectuelles sont innées; (2) que leur exercise ou leur manifestation dependent de l'organisation; (3) que le cerveau est l'organe de tous les penchans, de tous sentimens, et tous les facultés; (4) que le cerveau est composé d'autant d'organes particuliers qu'il y a de penchans, de sentimens, des facultés qui diffèrent essentiellement entr'eux." *Sur les fonctions du cerveau, etc.,* 1825, i, pp. vi and vii. *Cf. Anatomie, etc.,* 1818, iii, 364. Among the anatomists and the physiologists of the time the doctrine of equivalent function, later brilliantly supported by the impressive experiments of Flourens seems to have been in vogue; although Gall gives a respectable list of men who had contended for localisation. *Anatomie,* ii, 356-364. Willis had recognised the principle of cerebral localisation, and it appears (H. C. Bastian, *The brain as an organ of mind,* New York, 1887, 514) that he had been known as the "father of phrenology." It is interesting to find Boerhaave, who had exerted (possibly through Van Swieten, his disciple) a powerful influence at Vienna, contending for diverse seats for "apperception" and imagination on the ground of the separation of these faculties in sleep (Gall, *Anatomie,* ii, 361). Gall was, however, pretty certainly the first to make strict localisation an empirical and, as he thought, a demonstrable hypothesis, stripped of metaphysical implications.

[7] For an examination of the psychologists of this group the author is indebted to Miss Ethel Sabin, fellow in philosophy, University of Illinois.

[8] It is probable that Gall was familiar with this doctrine long before he left Germany and took up his residence in Paris (1807). Condillac's *Traité*

tion of Locke. Among the exponents of this view, those most often and most respectfully mentioned by Gall are Condillac, Bonnet, and Cabanis. Etienne Bonnot, Abbé de Condillac (1715-1780), the friend of Diderot and Rousseau, did most to establish in France the philosophy of Locke; although Locke's views had been introduced, in the first instance, by Voltaire. Charles Bonnet (1720-1790) was a scientist of note whom failing eye-sight drove to the solace of philosophical reflection. He follows Condillac in the doctrine of sensation, which they both owe to Locke, and he follows him also—independently, as it seems—in the famous use of the statue to illustrate the nature of sensation. Pierre Jean George Cabanis (1757-1808) was a French physiologist of considerable reputation, famous as physician to Mirabeau in his last illness.

In the formulation of sensationalism by these three contemporaries we find an important thread of Gall's psychology. Let us look first to Condillac, since Condillac is the first and most important of the three. In his "Essai sur l'origine des connoissances humaines" (1746),[9] Condillac accepts Locke's explanation of the double source of knowledge in reflection and sensation. Sensation, he maintains, is the material of our knowledge, and reflection and the other operations organizing this material, are the instruments of knowledge. But in the most important of Condillac's philosophical works, the "Traité des sensations," we find the disciple turned critic, rejecting Locke's theory of reflection. Sensations alone, he contends, are sufficient to explain knowledge. He now maintains that "the principal object of this work is to show that all our knowledge and all our faculties derive from sense or,—to speak with greater precision,—from sensations." In further criticism of Locke, Condillac declares that much that is significant about judgments has escaped his predecessor, for Locke supposes that the activities of the soul

des sensations was translated into German in 1780, Helvétius' *De l'esprit* in 1760, 1784 and 1787, and two of the essays of Bonnet about the same time. (Cf. Dessoir, M., *Geschichte der neueren deutschen Psychologie,* 1. Hlbbd., 2. Aufgabe, 1897, 128-30.)

[9] *Oeuvres complètes* (vols. 23), Paris, 1798. Tome i, 19, 517.

participate in an innate quality, reflection, with no suspicion that they owe their single origin to sensations.[10] In order separately to study sensation, Condillac imagines a statue equipped with a nervous organism which is ready to act but which has never acted. It is living, for it has a soul or mind, although it has never received an idea. Then upon the passive, waiting statue,—an obvious elaboration of Locke's *tabula rasa*,—the sensation of smell, the simplest of all sensations, is first allowed to play. This unmixed sensation of smell completely fills the psychic chambers as the light of a small wax taper may permeate an otherwise dark room;—if we may interpret metaphor by metaphor. The sensation of smell, like the light, is the only thing present. By the addition, then, of other sensations, this follower of Locke proceeds to reconstruct, without the overt use of any other materials, the whole series of mental phenomena.

In abolishing "reflection" as an organizing principle among ideas, Condillac should, in logical consistency, have reached Hume's sceptical conclusion that there is no uniting principle, that mind is a mere "heap of impressions." Gall observing either with more acumen or from a different perspective saw this difficulty and offered a solution. It was that mind is not only compounded but also organized and that there exists a material basis for the organization of mind just as truly as there exists a material basis for the sensations themselves. Again he says: "Bacon, Locke, Hume, Helvétius and Condillac found themselves obliged, in order to comprehend in some manner the possibility of the functions of the understanding, to have recourse not only to the senses which certain of these authors have so greatly exalted, but to a recognition of the association of sensations, or to attention, or to experience, or to reflection, or to induction. Although they have at times contradicted each other, they have nevertheless perceived that none of the faculties which we have just enumerated could appertain to any one of the senses. But if, in this life, no faculty at all could exercise itself without a material condition,—as we shall later prove beyond a doubt,—then there must of necessity be presupposed a material basis for

[10] *Oeuvres*, tome iii, 3, 6. This work seems to have been published in 1754.

the exercise of the intellectual faculties. The investigation of those organs through which animals and men receive their material impressions of the external world has always been regarded as very important. Will it be less interesting, less noble, to try to discover the organs of the superior faculties of the spirit?"[11] This quotation offers the key to Gall's whole system. It marks the point at which he breaks with this doctrine taken in its strictest form. Yet his purpose is clearly sensationalistic in its nature; it is to fill a gap in this doctrine and to answer a question which is distinctly sensationalistic in origin. He proposed to give to the functions of the brain the same degree of certitude as to the functions of the sensory apparatus. Much as we have seen Condillac explaining the growth of knowledge by the gradual addition of new senses, so we hear Gall declaring that the "faculties of the soul" develop in correspondence with the development of their appropriate organs in the brain. The doctrine of faculties appears, then, as something imposed upon the groundwork of Gall's sensationalism. He seems never to question that the sensationalists are giving an account which is correct so far as it goes.[12]

In Bonnet's psychological works[13] we find a resemblance closer,—in some respects,—than Condillac shows to the attitude of Gall upon the matter in question. Bonnet tells his readers again and again that man is a mixed being, in part physical and in part mental. Ideas come only by the intervention of the senses, and even the most abstract notions derive from the same source. It is in the body and by means of the body that the soul

[11] Gall, *Anatomie*, etc., 1810, i, 231-232.

[12] We cannot, of course, credit to Gall the discovery that the nervous system is, to a high degree, functionally integrated and unified. Functional interaction was empirically demonstrated at a much later time; although Cabanis (who wrote before Gall) firmly believed that "thought" depends upon the "intimate organisation" and the "integrity" of the brain. *Rapports du physique et du moral de l'homme* (1788—), tome iii, 189, in *Oeuvres complètes de Cabanis* (vols. 5), Paris, 1823-25.

[13] *Collection complète des oeuvres de Charles Bonnet* (vols. 18), Neuchatel, 1779-1788. The principal psychological volumes are *Essai analytique sur les facultés de l'ame* (1759), tomes xiii, xiv; *Essai de psychologie* (1754), tome xvii; and *La palingénésie philosophique* (1769), tome xv.

acts. We must, he says, always return in our consideration to the physical as the first cause of all the experiences of the soul. Gall is equally insistent upon explaining mind by reference to the body;—or rather more insistent, since it is the very heart of his theory. Are we in a better position, he asks, to explain hunger and thirst than thought? Although we can find no physical substance to be called hunger and thirst in the digestive tract, we still maintain that they are inside of us. Then why not admit, when we can find no physical traces of houses and trees in the eye and still localize vision there, that thoughts and ideas are in a similar manner dependent upon the brain?

The empirical tendencies in French psychology appear quite as strongly in Cabanis, the surgeon and physician, as in Bonnet. Sensibility is, with Cabanis, the final term. The sense organs on the outside of the body furnish the materials for reason, the organs within, the materials for the instinctive life. Innate needs account for the faculties. The mental constitution is determined by the physical; although education is able to change both mind and body. The diverse functions of the brain are to combine and to rearrange impressions, to attach signs, and so to produce thought.[14]

In these declarations we find the French sensationalists, as well as Gall, approaching the problem of mental organization. They seem, moreover, to be in essential agreement. The disagreement lies not in principle but in emphasis. The French sensationalists look to the structure of the brain and nervous system to account for what they call the diversity of sensations and the unity of consciousness, and they make attention, desire, volition, memory, and even judgment, the result of the combination in the brain of sensory excitations. Gall, on the other

[14] "C'etait par Locke que devait, pour la première fois, être exposé clairement et fortifié de ses preuves les plus directes cet axiome fondamental, *que toutes les idées viennent par les sens ou sont le produit des sensations.*" *Oeuvres*, tome iii, 11. Gall remarked in precisely the same spirit that "il est impossible au naturaliste de douter plus long-temps que, dans cette vie, l'esprit ou l'ame a besoin d'instrumens matériels, et que ceux-ci sont multipliés et diversifiés, suivant que les facultés de l'ame sont plus variées et plus nombreuses." *Anatomie*, 1810, i, 10.

hand, does not rest in sensation but exalts those integrative functions which he calls the "higher faculties" and which possess, as he thinks, organs as strictly localized as are the organs of sense.

Gall himself was not unaware of his close relation to the sensationalists, and he believed, moreover, that they too were tending toward some theory of integrative faculties. Of Bonnet he says that his predecessor found in the brain fibres with particularized functions which could be likened to his own cerebral organs. Moreover, he recalls that Bonnet also held that any one who should thoroughly understand the structure of the brain would be able to read all that passed there "as in a book."[15] Finally, he says, the time is not far distant when, convinced by the evidence, we shall agree with Bonnet, Condillac, Herder, Cabanis, Prochaska, Sömmerring, Reil and others that all the phenomena of animate nature are based on the organism in general and all intellectual phenomena on the brain in particular.[16]

That Bonnet at least was working in the direction of faculties appears in other instances than those noted by Gall. This trend is clearly seen in his exposition of the benefits of education,[17] which, by the way, is almost identical with Gall's theory, of which the followers of phrenology today make capital. Both believe that by the exercise of the organs of the "higher senses,"—fibres for Bonnet, cerebral areas for Gall,—a superior power and strength will accrue to these organs and thus the "higher" nature will gain control over the lower.

[15] Gall, F. J., & Spurzheim, G., *Recherches sur le système nerveux en général, et sur celui du cerveau en particulier; mémoire présenté à l'institut de France, le 14 mars, 1808; suivi d'observations sur le rapport qui en a été fait à cette compagnie pas ses commissiares,* Paris, 1809, 248. On the same page, the authors remark that Herder, also, had conceived the idea of "la pluralité des organes intellectuels."

[16] *Ibid.*, p. 273.

[17] Bonnet, Ch., *Oeuvres,* etc., tome xiii, (*Essai analytique sur les facultés de l'ame*), p. 516.

III. The Influence of "Faculties" and of German Empirical Psychology

We come now to the "faculties" themselves, as they appear in Gall and in his predecessors. The criticism of faculties which has come to be a tradition in psychology complains that the doctrine confuses description and explanation, that it uses such class-terms as thought, memory and will to stand for the causes or at least the empirical conditions of observed mental phenomena.[18] There is no doubt that the logic of the doctrine is faulty. That is a spurious explanation which refers a fact to its class-name. A given instance of choice may be better understood as a fact when it is identified as an instance of will, but it is not thereby explained; and we know nothing further about the antecedents of an eristic outburst of temper after we have been told that the outburst is due to a faculty of combativeness.

Now the atmosphere in which Gall matured at Strassburg and Vienna was the atmosphere of faculties. Wolff had written his *Psychologia Empirica* in 1732, his *Psychologia Rationalis* in 1740, and among the defendants and critics of the Wolffian teachings had stood the names of Baumgarten, G. F. Meier, C. A. Crusius, and J. A. Eberhard. Gall spoke the language of faculties as naturally as we speak the language of organic evolution, of commercial barter, and of international strife. But notice also that Gall, the man of science, was constrained to use the doctrine of faculties in a manner that must seem to us peculiarly modern and familiar.

I mean that Gall-the-anatomist and Gall-the-follower-of-Condillac-and-Bonnet was bound to replace the empty causes of Wolff by the organic causes of anatomy and of sensationalism. Nothing is more evident in Gall's expositions of his doctrine than

[18] G. F. Stout (*Manual of Psychology*, 1899, 103 ff) suspects that we condemn too harshly the doctrine when it merely refers "this or that state or process to a corresponding faculty without pushing the enquiry further so as to raise the question of causal explanation"; but it is surely just this vague intimation that the "reference" is an approach to explanation that makes the doctrine especially vicious and dangerous. Current psychologies are full of these half-faculties. Instances that come at once to mind are James's fiat, Wundt's apperception, Lipps's unconscious, and Angell's attention.

his attempt to realize Bonnet's hope that a thorough understanding of the structure of the brain should make that organ an open book to the psychologist;—should provide, that is to say, a complete organic basis, not alone for sensations but for all the more involved and elaborate functions of mind.[19]

In our search for the antecedents of Gall's theory, the strongly empirical trend in German psychology which appeared toward the close of the eighteenth century must not be overlooked. Crusius, who died (1775) just before Gall reached maturity, had rejected Wolff's potential faculties (Vermögen), the *nudae agendi possibilitates,* because they explained nothing. He substituted for them the forces (Kräfte) of thought, judgment, imagination, and the like, which he conceived as empirical powers of mind.[20] This revised conception of faculties, rather than Wolff's, seems to have been the view current in Gall's time. The physiological psychologist Karl Franz von Irwing (1728-1801) came a step nearer the position of the sensationalists in his declaration that the most abstract integration of ideas, as well as sensations themselves, found a basis in the fibrous structures of the brain. Over this "finer organization" the mind presided with its faculties of analysis, synthesis and comparison.[21] Irwing's emphasis upon feelings and impulses, conceived as the springs of mental activity, leads naturally to Gall's doctrine that the faculties are innate, and that they appear throughout the development of the individual in the form of instincts, tendencies and aptitudes.

Gall's whole psychophysical system is plainly based upon heredity. The original nature of man furnishes his fundamental problem. It is natural, then, that both the Wolffian *nudae possibilitates* and the more empirical mental forces of his own day should have seemed, to Gall, to be vague and empty concepts.

[19] Gall is careful to say (*e.g., Anatomie,* i, p. xxv) that he does not pretend to *explain* the faculties by reference to cerebral organs; but he does find that the structures of the brain have a "necessary and immediate relation" to their functions.

[20] Crusius, C. A., *Entwurf der notwendigen Vernunftwahrheiten,* 3rd ed., 1766, 129, 130, 137.

[21] *Erfahrungen und Untersuchungen über den Menschen,* Berlin, 2nd ed., 1777, i, 73, 88, 128, 419.

Putting together the crude psychophysics of Condillac, Bonnet, and the German physiologizing psychologists with his own superior knowledge of cerebral anatomy and of comparative physiology, Gall is led to insist that the sensory and motor centres in the cortex must be supplemented by other similar organs which provide the constitutional basis for the whole range of mind. It is, then, a logical consequence of his empirical methods which took Gall beyond will, attention, understanding, imagination, and the like general and abstract attributes of mind, and which prompted him to seek the particular and special impulses, memories, instincts, and capacities, actually to be observed in a given species or in a given individual.[22]

IV. Gall's Doctrine and Modern Psychology

Surely no time could be more favorable than our own to the appreciation of a man who insisted that education had been overdone, that man is not, as current belief made him, a blank volume to be written full by the schoolmaster, that character is not the product of environment; who insisted, on the positive side, that the psychophysical constitution is innate and that the springs of experience are to be sought in heritable structures with their inclinations and functions impressed upon them by racial history.

So long as we are content, as Gall was not content, vaguely to use "habit," "instinct," "past experience," and "neural arcs" as speculative or undefined terms of explanation, so long we cannot, with good grace, set Gall aside as a fantastic master of cranial prominences.

It is, of course, evident to us, after a hundred years, that the faculties and forces of the eighteenth century were not based upon a proper classification of observed mental functions,—the proper classification for which we still are searching. Some of them may indeed turn out to be inherited integers: we hear a good deal of "general intelligence," and geneticists have soberly affirmed that musical capacity represents a unit character; but

[22] Gall's principles of analysis, by which he arrives at the fundamental forces, are given in *Anatomie*, etc., 1819, iv, 277-78.

the fate of faculties does not matter. The main point is that Gall took current psychology of both kinds, the German kind and the Anglo-French kind, and by conjoining it with a knowledge of the central nervous system which seems to have been decidedly superior to the neurology of his contemporaries, he tried to establish the bodily conditions of mental existence and of mental performance.

Surely we, in our day, can understand and applaud this attempt. So energetically do we try to do the same thing that we are prone,—unless we are balanced by historical perspective,—either to fabricate these organic conditions out of shreds of fact and speculation about arcs and synapses, or else, through biological and philosophical bias, completely to divest ourselves of psychological interests and to plunge headforemost into physiology and kinetic ecology.

Gall himself was zealous in his search for biological explanations; but his psychology, such as it was, he never forsook. His fixed conviction that mental processes and functions have a specific, not a general, dependence upon bodily processes running in heritable grooves we still maintain, although we now know (thanks to better scientific technique) that the brain does not show the kind of localizable functions that Gall—or, for that matter, that Paul Flechsig—believed in. But our own neurological knowledge is far from being adequate to the psychological facts. Current books and articles are full of neurological terms which give out, when sounded, a hollow ring. Whenever the weight of explanation is laid upon them there is danger that they, too, as much of Wolff's *vis repraesentativa,* will become mere names used to conceal ignorance.

To conclude, then, the founder of phrenology attacked the venerable problem of the organic conditions of mind. Mind, regarded from the more "active" side, he described in the terms of the native German psychology of his day, viewed from the more "passive" side (as the historical distinction runs), in the terms of the English and French sensationalists. Finding his clue in the organs of sense and their central correlates, he proceeded to dispose of the several functions or faculties, in a simi-

lar way. For Bonnet's specialized fibres, which had a transforming and integrative function, Gall substituted a large group of innate cerebral organs which corresponded—as he thought—to the mental talents and faculties. The historical importance of Gall touches not so closely the vagaries of his doctrine of phrenology as the fact that he sought empirically to integrate the psychological and anatomical knowledge of his time. Gall's problem is still in process of solution. At times it is evaded and at times it is distorted by the illicit use of mental or neurological faculties for which our own riper time offers no justification. Neither evasion nor distortion, however, is likely to advance the problem, which still requires a candid and empirical resolution.

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